MINORITY STRESS AND SUBSTANCE USE IN LESBIAN, GAY, BISEXUAL, QUEER, AND QUESTIONING ADULTS: AN EXPLORATION OF OUTNESS AND FAMILY ATTACHMENT

Justine M. Ray

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Committee:
Carolyn Tompsett, Advisor
Francesco Cabanillas
Graduate Faculty Representative
Harold Rosenberg, Advisor
Michael Zickar
ABSTRACT

Carolyn Tompsett, Co-Advisor

Harold Rosenberg, Co-Advisor

The minority stress model (Meyer, 1995, 2003) may explain the higher rates of substance use found in some lesbian, gay, bisexual, queer and questioning (LGBQ) individuals compared to non-LGBQ individuals. Guided by the model and previous research, I examined whether outness about one’s sexual orientation and attachment to family of origin moderated the relationship between minority stress and substance use in LGBQ adults. To evaluate my hypotheses, I recruited two samples of LGBQ participants, one using social media (N=341) and another using a classified ad website (N=180), to answer questions about their drug and alcohol use, level of outness, experiences of minority stress, and attachment to family of origin. As predicted, higher levels of minority stress were significantly, albeit weakly, correlated with higher rates of substance use. However, contrary to expectations, stronger family attachment and higher level of outness were not associated with lower substance use in either sample. Instead, participants who reported higher levels of outness were more likely to report problem drug use. Because reported substance use was considerably lower than I expected in both samples, my study may not have provided a sensitive test of the hypotheses. The results could indicate that rates of substance use by LGBQ individuals are declining, and failed to support the hypothesis that strong family attachment is associated with lower rates of substance use in LGBQ adults. Further research should evaluate how LGBQ people mitigate minority stress other than by self-medicating with alcohol and drug use.
I dedicate this dissertation project to my beloved grandmother, Marie Catherine Spinner Mason, 1920-2009, who always knew I would be a doctor one day.
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LITERATURE REVIEW

A major focus in the study of lesbian, gay, bisexual, and queer (LGBQ)\(^1\) people is health disparities between LGBQ and non-LGBQ individuals (Coulter, Kenst, Bowen, & Scout, 2014; Meyer, 2012), and, more specifically, mental health disparities between LGBQ and non-LGBQ people (Grant et al., 2014; Hatzenbuehler, 2014; King et al., 2008; Meyer, 2012). For example, Grant and colleagues (2014) found that college students who identified as LGB\(^2\) reported more symptoms of anxiety and depression than non-LGB students. LGB students also tended to be more overweight and reported engaging in maladaptive behaviors, such as compulsive shopping and compulsive sexual behavior, at higher rates than non-LGB students (Grant et al., 2014).

Additionally, Hatzenbuehler (2014) showed that LGBQ people who lived in locations without non-discrimination ordinances reported higher incidences of dysthymia, generalized anxiety disorder, and posttraumatic stress disorder. In a meta-analysis of 25 studies that compared the mental health of LGBQ and non-LGBQ adolescents and adults, King et al. (2008) reported that twice the proportion of LGBQ individuals met criteria for depression in the past year compared to non-LGBQ individuals. LGBQ people were also more likely to meet diagnostic criteria for anxiety disorders in the past year compared to non-LGBQ controls (King et al., 2008).

\(^{1}\) Although trans (an umbrella term including transgender, genderqueer, and gender non-conforming) individuals are commonly included when referring to non-heterosexual persons, I did not recruit trans individuals for the current study. Gender identity is considered a separate issue from sexual orientation.

\(^{2}\) The use of LGB here and throughout the document indicates that the authors of a study did not specifically identify queer or questioning participants as part of the population, and LGBQ indicates that the samples also included individuals who identified as queer or questioning.
Substance Use by LGBQ People

In addition to higher prevalence rates of anxiety and depression in LGBQ people, researchers have found disproportionate levels of substance use and abuse in LGBQ people when compared to non-LGBQ people (Austin & Bozick, 2012; King et al., 2008; Green & Feinstein, 2012; Marshal et al., 2008). In a meta-analysis conducted by staff of the Center for Substance Abuse Treatment of the Substance Abuse and Mental Health Services Administration (SAMHSA, 2001), researchers found that LGBQ adults consistently reported higher rates of daily substance use, more episodes of binge drinking, and higher lifetime prevalence of substance abuse when compared to heterosexual peers.

In a subsequent meta-analysis, King and colleagues (2008) reported that LGB adolescents and adults were 2.7 times more likely than non-LGB adolescents and adults to meet the criteria for drug dependence in the 12 months prior to data collection. The researchers also found that lesbian and bisexual women were 3.5 times more likely and gay men were 2.4 times more likely than heterosexual controls to be dependent on drugs (King et al., 2008).

In 2008, Marshal and colleagues discovered a consistently higher prevalence of substance use in LGBQ adolescents when compared to heterosexual peers. LGBQ adolescents were 3.1 times more likely to have used cocaine in their lifetimes when compared to heterosexual adolescents. They also had a higher probability of using more dangerous routes of drug administration; for example, LGBQ adolescents were 7.2 times more likely to have injected drugs at some point during their lifetimes compared to heterosexuals (Marshal et al., 2008).

Green and Feinstein (2012) identified several factors that may be correlated with increased substance use in the LGBQ community. One such factor is the individual’s level of engagement and/or involvement in the LGBTQ community. Green and Feinstein (2012)
suggested the relationship between involvement in the LGBTQ community and substance use might be partially explained by social learning theory, which posits, in part, that an individual’s peer group influences behavior through observation and imitation. Historically, bars and nightclubs have been a popular social gathering place for LGBTQ people, and substance use is normative behavior in these locations. Green and Feinstein also note that LGBTQ people may use substances more often and in greater amounts if they perceive substance use as a normative group behavior in the LGBTQ community (Green & Feinstein, 2012).

One limitation in the literature addressing increased substance use in LGBTQ populations is that researchers often categorize participants as either gay/lesbian or heterosexual. Green and Feinstein (2012) noted a dichotomous categorization of sexual orientation is oversimplified and likely limits our understanding of the relationship between substance use and sexual orientation. Researchers should utilize a dimensional approach to measure sexual orientation to better understand the relationship between sexual orientation and substance use (Green & Feinstein, 2012). To assess sexual orientation, researchers can ask participants about sexual identity, attraction, and behavior, and provide additional sexual identity categories such as bisexual, queer, and questioning.

**Stress and Substance Use**

Research has established an association between stress and substance use initiation, abuse, and relapse in both LGBTQ and non-LGBTQ individuals (Lijffijt, Hu, & Swann, 2014; Sinha, 2001, 2008; Stress and Substance Abuse: A Special Report After 9/11, n.d.). The self-medication hypothesis is one explanation for the relationship between stress and substance use. The self-medication hypothesis proposes that some people use and abuse alcohol and other drugs to avoid and relieve symptoms of stress and other psychological disorders (Khantzian, 1997). For
example, a person may drink alcohol to decrease anxiety or might use stimulants to counteract the loss of energy that often accompanies depression. By relieving symptoms, substance use is reinforced and is more likely to occur again. When that person continues to drink alcohol or take drugs to manage his or her mood, he or she is more likely to develop physiological or psychological dependence (Leeies, Pagura, Sareen, & Bolton, 2010; Simpson, Stappenbeck, Luterek, Lehavot, & Kaysen, 2014).

Researchers interpret the high rates of comorbidity between posttraumatic stress disorder (PTSD) and substance use disorders (SUDs) as additional support for the association between stress and substance use. For example, Leeies and colleagues (2010) studied data from the National Epidemiologic Survey on Alcohol and Related Conditions, a nationally representative sample of mental illness in adults, and found that 21.4% of participants who met diagnostic criteria for PTSD reported using alcohol and/or drugs to manage those symptoms. Participants were asked if they used alcohol and/or drugs to relieve PTSD symptoms and were then grouped into one of three categories: no self-medication, self-medication with alcohol only, and self-medication with drugs and alcohol. The researchers reported that those individuals who used alcohol and/or drugs to self-medicate PTSD symptoms had higher lifetime prevalence rates of alcohol and drug use disorders (Leeies et al., 2010).

Simpson and colleagues (2014) provide additional empirical support for the self-medication hypothesis as an explanation for the high comorbidity of PTSD and alcohol use disorders. Participants were asked to monitor each day both the number of standard alcoholic drinks they consumed and the severity level of their PTSD symptoms. Results indicated that every 1-unit increase in PTSD symptoms was associated with a 20% increase in the number of drinks that day and a 7% increase in the number of drinks on the following day. Interestingly,
participants who reported using alcohol to reduce negative emotions or increase positive emotions had an even greater association between PTSD symptom severity and amount of alcohol use. Specifically, participants who used alcohol to reduce negative emotions had a 37% increase in amount of alcohol for every 1-unit increase in PTSD symptoms. Participants who used alcohol to increase positive emotions had a 45% increase in alcohol use for every 1-unit increase in PTSD symptom severity. Simpson et al. (2014) interpreted these data to indicate that people who used alcohol to manage a chronic stress disorder had an increased likelihood of developing and maintaining problematic substance use.

Another explanation for the association between stress and substance use involves the hormone corticotropin-releasing factor (CRF). CRF is released when organisms experience acute and/or chronic stress. When CRF is produced by an individual’s brain, it may elicit compulsivity, an increased sensitivity to incentives, and a decreased sense of control (Logrip, Koob, & Zorrilla, 2011; Sinha, 2001, 2008). These psychological outcomes of stress and elevated CRF can lay the foundation for the initiation and maintenance of substance use. Additionally, when an individual ceases taking an addictive substance after a period of physical dependence additional CRF is released in the extended amygdala. The overproduction of CRF and the other physical and emotional symptoms of withdrawal can increase an individual’s drug craving and proclivity to relapse (Logrip et al., 2011).

The Minority Stress Model

All people experience some level of psychological stress, which Lazarus and Folkman (1984) defined as “…a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (p. 19). Meyer (1995) proposed the minority stress model to explain the additional
and unique stress that may be experienced by members of socially stigmatized groups (Meyer, 1995, 2003). The minority stress model is based on three theoretical assumptions: (a) the stress associated with identifying as part of the stigmatized group requires additional coping that is not required by individuals in the majority group; (b) due to their group membership, the stress experienced by those in the stigmatized group is chronic; and (c) the stress experienced by members of minority groups is associated with the stigma created by social and cultural values rather than factors such as biology or physiology (Meyer, 2003).

This model (Meyer, 1995, 2003) may help explain the previously documented phenomenon of higher rates of substance use in LGBQ individuals (Austin & Bozick, 2012; Cochran, Keenan, Schober, & Mays, 2000; King et al., 2008; Kelleher, 2009; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Weber, 2008). The application of the minority stress model (Meyer, 1995, 2003) to substance use in the LGBQ community is supported by research that shows higher levels of stress predict more physical and mental health problems (Dohrenwend, 1998; Lazarus & Folkman, 1984; Pearlin, 1999) and research that demonstrates LGBQ people experience more stress than non-LGBQ people due to their minority status (DiPlacido, 1998; Herek, 2009; Meyer 2003, 2012).

The minority stress LGBQ people experience can include micro-aggressions, or subtle, unintentional words or actions that reinforce stereotypes about a particular group of people, such as the presumption of heterosexuality, or the casual use of homophobic slurs (Hatzenbuehler, Corbin, & Fromme, 2010; Herek, 2009; McCabe et al., 2009; Meyer, 2012; Weber, 2008). Minority stress also includes blatant forms of maltreatment, as described by Herek (2009), who found that nearly 20% of 662 respondents had experienced a physical attack, sexual assault, robbery, or damaged property that they attributed to their sexual orientation. Almost half (49%)}
of Herek’s sample reported verbal abuse or harassment during their lifetime that respondents attributed to their sexual orientation. Eleven percent of respondents were denied employment, housing, or asked to leave a job or home because of their sexual orientation. Herek (2009) also noted that a higher percentage of gay men experienced violence against their bodies or property (38%) compared to lesbians (13%), bisexual men (11%), and bisexual women (13%).

It is important to consider sociocultural changes in LGBQ issues that have occurred in the thirteen years since Meyer (2003) first proposed the minority stress model. Some of those changes include anti-discrimination legislation (Movement Advancement Project, 2015), a repeal of the Defense of Marriage Act in June 2013, which increased access to federal benefits for same-sex couples (Matthews, 2013), and a Supreme Court decision in 2015 mandating marriage equality (Obergefell v. Hodges, 2015). Despite these legal supports for the rights of LGBQ people, many individuals continue to experience discrimination in the areas of housing and employment. The Employment Non-Discrimination Act (ENDA), a bill that would prohibit employers from engaging in discriminatory hiring and firing practices based on an employee’s sexual orientation or gender identity, has been defeated by every U.S. Congress since it was first introduced in 1994 (O’Keefe, 2013). The lack of federal protection leaves many LGBQ individuals more vulnerable to employment discrimination when compared to non-LGBQ people or to protected groups, such as racial/ethnic minorities, women, and religious minorities.

Although changes in the sociocultural climate for LGBQ people have been largely positive, LGBQ individuals continue to experience stress related to their sexual minority status (Hatzenbuehler, Corbin, & Fromme, 2010; Herek, 2009; Gattis, 2009; McCabe et al., 2009; Meyer, 2012).
Minority Stress and Substance Use

Meyer (2003) applied the minority stress model to better understand the higher prevalence rates of substance use disorders in sexual minorities. He conducted a meta-analytic review of random and nonrandom population-based studies and found that the lifetime occurrence of substance use disorders was higher for LGB men (OR = 1.45, 95% CI = 1.10, 1.91) and women (OR = 3.47, 95% = 2.22, 5.50) compared to heterosexual peers. Meyer concluded that the stress of being a sexual minority contributed to the higher prevalence of substance use disorders and other mental health problems in LGB individuals, and he suggested that researchers should seek to understand the factors that contribute to increased minority stress and prevalence of mental health problems in these populations (Meyer, 2003).

Several researchers in addition to Meyer (2003, 2012) have demonstrated the relationship between experiences of minority stress and substance use (Goldbach, Tanner-Smith, Bagwell, & Dunlap, 2014; McCabe, et al., 2010; Weber, 2008). For example, Weber (2008) found that LGB people who endorsed internalized homophobia and experiences of heterosexism were more likely to report substance use and dependence. McCabe and colleagues (2010) measured the association between discrimination based on sexual orientation, race, and gender, and the prevalence of substance use disorders in 577 LGB adults. Those who had experienced all three forms of discrimination had the highest rates of past-year substance use disorders (McCabe et al., 2010).

Researchers have also reported that LGBQ adolescents who experience anti-gay discrimination are more likely to report using substances. For example, a recent meta-analysis of 15 empirical studies reported that gay-related victimization was significantly correlated with substance use (r = .24) in adolescents (Goldbach et al., 2014). The only two risk factors out of
the 29 studied that correlated more highly with substance use in LGBQ adolescents were general victimization ($r = .60$) and externalizing problem behavior ($r = .38$). Because most research focused on substance use in LGBQ individuals is correlational, it is important to be mindful of potential third variables, such as social support, that may impact both substance use and minority stress.

The research outlined above provides some initial support for the application of the minority stress model to explain the higher prevalence rates of substance use in the LGBQ community. As Meyer suggested, it could be beneficial to examine the factors that moderate the relationship between minority stress and substance use to further our understanding of substance use in the LGBQ community. Meyer (2003, 2012) identified several such factors, including coping ability, social support, and level of transparency about one’s minority identity.

**Associations of “Outness” with Mental Health in LGBQ Individuals**

According to the minority stress model, the level of “outness” —that is, the degree to which an individual is transparent about his or her sexual orientation—may moderate the effect of stress on substance use. Some researchers suggest that the more open a person is about his or her sexual orientation, the less psychological distress that person reports (Feldman & Wright, 2013; Frable, Platt, & Hoey, 1998; Meyer, 2012; Savin-Williams, 1998). Other researchers found no significant relationship between level of outness and mental health (Brady & Buse, 1994; Frost & Meyer, 2009).

Some researchers have reported that individuals with a higher level of outness exhibit more psychological distress (Gattis, 2009; Huebner & Davis, 2005; Koh & Ross, 2006; Savin-Williams, 1998). For example, Koh and Ross (2006) found that participants who identified as bisexual and were more open about their sexual orientation reported higher levels of suicidality.
Gattis (2009) also highlighted the increased probability of LGBTQ youths becoming homeless after disclosing their sexual orientation to parents and family members, leading to increased instability and psychosocial problems. Savin-Williams (1998) reported that adolescents who disclosed their sexual orientation to parents and loved ones often experienced harassment, verbal and physical abuse, substance abuse, and attempted suicide more frequently than prior to disclosing their sexual orientation. In 2005, Huebner and Davis reported that gay and bisexual men who were more out at work had higher levels of the stress hormone cortisol in their saliva compared to the men who were less open about their sexual orientation. As one potential explanation for these findings, Thoits (1999) posited that identification with the stigmatized group can lead to greater distress because stressors become more salient and impactful for individuals who identify strongly with the stigmatized group.

Researchers have also noted the positive psychological impact experienced by LGBTQ people when they are open about their sexual orientation (Frable et al., 1998; Meyer, 2012; Pachankis, 2007; Savin-Williams, 1998). There are several explanations for the mental health benefits of being open about one’s sexual orientation (Meyer, 2012; Savin-Williams, 1998). First, it may be physically and mentally exhausting to conceal one’s LGBTQ sexual orientation or maintain an image of heterosexuality. Because romantic relationships are often a major aspect of an individual’s life, concealment in this area can be especially tiring. Concealment can also lead to lower self-esteem if individuals who hide stigmatized elements of their identity have limited contact with others who share that identity. Unlike individuals who belong to racial or religious minorities, LGBTQ individuals often have few if any family members who belong to the same minority group. The beliefs and opinions a person holds about his or her identity tend to reflect the stereotyped and negative views of the larger society when an individual does not have
relationships with other people in his or her in-group (Frable et al., 1998). Conversely, when LGBTQ individuals are out, they may have more opportunities to connect with the resources and support available within the broader LGBTQ community that can serve as protective factors against psychological problems (Meyer, 2003, 2012). Finally, being out can reduce the stress associated with the possibility of friends or family members discovering one’s sexual orientation (Savin-Williams, 1998).

Feldman and Wright (2013) recently conducted a study about outness and LGBTQ identity formation and how these factors related to participants’ self-esteem, psychological functioning, and life satisfaction. The researchers recruited participants who identified as LGBTQ and were at least eighteen years old from online sources, college campuses, hospitals, and mental health clinics in the New York City area. Participants who reported a highly integrated sexual orientation identity had significantly higher self-esteem, greater life satisfaction, and lower reported psychological problems when compared to LGBTQ people whose identity was not as integrated. Feldman and Wright (2013) suggested this could be explained by the positive consequences of being out and having a highly integrated identity, including connection to the LGBTQ community, which would likely improve mental health. Conversely, due to the correlational nature of the study, good mental health could have a positive impact on outness and identity integration. Additionally, other variables, such as community environment and family support, could explain both good mental health and having an open and integrated sexual orientation identity.

**Family Factors in LGBTQ Individuals**

Social support, specifically support from one’s family of origin, has been identified as another important factor that may moderate the relationship between minority stress and
psychological problems (Padilla, Crisp, & Rew, 2010; Rotosky et al., 2004; McDowell & Serovich, 2007). For example, McDowell and Serovich (2007) found that perceived and actual social support from one’s family of origin was negatively correlated with symptoms of depression and loneliness in a sample of gay, HIV-positive adult men. In another study of 20 gay couples and 20 lesbian couples in relationships lasting at least six months, Rotosky et al. (2004) found that lack of support from one’s family of origin was associated with higher levels of anger, emotional pain, and anxiety.

Researchers have also demonstrated that support from one’s family of origin is negatively correlated with substance use in LGBQ samples. Padilla and colleagues (2010) found that LGBQ adolescents who were supported and accepted by their parents reported less frequent consumption of drugs and alcohol in the 30 days prior to data collection. The researchers suggested that parents who accepted their adolescent’s non-heterosexual orientation served as a protective factor against substance use. Because the study was correlational in nature, it is also plausible that lower levels of substance use by adolescents could have led to higher rates of parental acceptance.

**Alternative Explanations for Increased Substance Use in LGBQ Individuals**

Although the minority stress model is the predominant theory researchers use to explain the higher rates of substance use in LGBQ people, some researchers have identified and explored other possible explanations. The “party and play” (PnP) phenomenon, a subculture of gay men who use drugs and engage in anonymous sex in bar and nightclub settings, could account for elevated substance use among gay men (Frederick, 2012; McKirnan & Peterson, 1989). This explanation illustrates a cultural or social model of substance use in which excessive drinking and drug taking are viewed as an outcome of modeling and social reinforcement by others in
one’s social group. Frederick (2012) cited social stigma as a major factor in the creation of the PnP subculture, meaning that individuals who engage in this subculture do so, in part, in reaction to living in a homophobic/heterosexist majority culture. One main limitation of this explanation is that it applies to only a small subgroup of this population and not the entire LGBQ community (Frederick, 2012).

Another explanation proposed for increased substance use in LGBQ communities is a presumed lack of morals that leads to both substance abuse and same-sex sexual behavior. The notion that LGBQ people are less moral than heterosexual people has no empirical support and instead appears to be based on cultural and religious ideology (Slick, n.d.; Feldman, n.d.). Although it can be useful to consider a breadth of potential explanations for higher rates of substance use in LGBQ people, I found the minority stress model to be the most plausible and to have the most empirical support.
SUMMARY AND HYPOTHESES

The minority stress model (Meyer, 1995, 2003) offers one explanation for the disproportionately higher rates of substance use by LGBQ people. This model is supported, in part, by research that demonstrates an association between higher levels of stress and substance use and research that demonstrates that LGBQ people experience minority stress due to their membership in a socially stigmatized group. Improved understanding of substance use in the LGBQ community could assist mental health professionals to provide more effective prevention, assessment, intervention, and relapse prevention services for LGBQ people who abuse substances. Because research has suggested that family attachment and outness may moderate the relationship between minority stress and substance use, I designed the current study to investigate the relationships among these variables. Based on the minority stress model and the research outlined above, I proposed the following hypotheses (also illustrated in Figure 1):

H1: Higher total scores on the minority stress measure would predict higher reported substance use.

H2: Positive family attachment would moderate the relationship between the level of minority stress and substance use. Specifically, it would decrease the correlation between minority stress and substance use.

H3: Level of outness would interact with positive family attachment to moderate the relationship between minority stress and substance use. More precisely, positive family attachment would moderate the relationship between minority stress and substance use in participants with a high level of outness, but would not moderate the relationship between minority stress and substance use for participants with a low level of outness.
Overview of Current Study

To investigate the above hypotheses, I recruited two separate samples of individuals who identified as LGBQ to answer questions about their experiences of minority stress, family relationships, level of outness, and use of drugs and alcohol. I initially recruited participants largely from Facebook groups specifically designated for the LGBTQ community. Many universities and LGBTQ community centers around the United States agreed to post my recruitment notice (See Appendix A) on the front page of their Facebook group, which resulted in responses from over 530 participants in less than two weeks. This sample reported unexpectedly low rates of alcohol and drug use. Average scores on the Alcohol Use Disorders Identification Test (AUDIT) in Sample 1 of the current sample were 58% lower than in a 2013 study in which the authors utilized the same measure (Hequembourg & Dearing, 2013). Additionally, Hequembourg and Dearing (2013) reported that 58.8% of their sample had used marijuana in the previous year, but only 36.4% of Sample 1 participants disclosed use of any illicit drug in the previous year. These low rates of reported substance use may have limited my evaluation of the relationships between substance use and the independent variables.

Because it was unclear if the lower rates of substance use were particular to this sample and the recruitment technique, I recruited a second sample with a modified recruitment technique. Instead of using social media, I posted the study recruitment to Craigslist, a classified ads website, under the “Volunteer” heading within the “Community” section. I posted the recruitment message on the local Craigslist site for the three most populated cities in each of the 50 states. I utilized this procedure with the intention of recruiting a more diverse sample of LGBTQ individuals than Sample 1, which comprised predominantly of college students and/or individuals connected to LGBTQ community centers.
METHOD

Recruitment and Data Collection Procedure

After I received approval from the Human Subjects Review Board at Bowling Green State University, I recruited self-identified lesbian, gay, bisexual, queer, and questioning individuals, aged 18 years and older from various social media outlets in Sample 1 and from Craigslist in Sample 2. Potential participants clicked the Qualtrics link that directed them to the informed consent and then the surveys, which were presented in random order to reduce order effects. I offered Sample 1 participants the opportunity to win one of fourteen $25 gift cards to Amazon.com. I did not offer an incentive for participation in Sample 2 so that people who were interested only in the incentive would not participate. This change in methodology appeared to be associated with fewer sets of incomplete data; I removed only 3% of cases in Sample 2 due to incomplete data compared to having removed 30% of cases in Sample 1. Further information about the removal of participants due to incomplete data and the demographic characteristics of those retained for the analyses is presented in the Results section.

Measures

Sexual Orientation. Based on a procedure employed by Talley, Sher, and Littlefield (2010), I assessed participants’ sexual orientation with five questions. First, I asked participants to select which of a set of descriptors (“lesbian,” “gay,” “bisexual,” “queer,” “questioning,” or “straight,”) described them best. Next, I asked participants about their romantic attraction, sexual behavior, and partnership status. If participants responded inconsistently to the various indicators of sexual orientation, for example, if one identified as “straight” and reported sexual attraction to members of the opposite sex and members of the same sex, their responses were not included in data analyses. This measure can be found in Appendix B.
Outness Inventory. Mohr and Fassinger (2000) designed this inventory to measure (a) the degree to which individuals in a respondent’s life know about his or her sexual orientation; and (b) the degree to which the respondent speaks openly with these individuals about his or her sexual orientation. Respondents rate their level of openness about their sexual orientation with 11 people or groups of people, including mother, father, siblings, work peers, and new straight friends. Examples of the seven response options include: “person might know about your sexual orientation, but it is never talked about;” “person probably knows about your sexual orientation, but it is rarely talked about;” and “person definitely knows about your sexual orientation, and it is openly talked about.” I averaged responses across the 11 contact persons/groups so that higher scores indicate a greater level of outness. Researchers report that the internal consistency for the overall Outness Inventory has varied from acceptable (α = .79; Rickard, 2014) to good (α = .87; Balsam & Mohr, 2007). In the current study, Cronbach’s α for the overall Outness Inventory was .86 (Sample 1) and .89 (Sample 2). I used the overall score in the current study because it demonstrated higher internal consistency than the subscales. This measure can be found in Appendix C.

Daily Heterosexist Experiences Questionnaire. Balsam, Beadnell, and Molina (2013) designed this questionnaire to measure minority stress in lesbian, gay, bisexual, and transgender individuals. Balsam and her colleagues (2013) created items based on Meyer’s (2003) minority stress theory, focus groups and interviews with LGBT adults in Washington State, and national online studies. The resulting measure comprises 50 items, and includes statements such as “difficulty finding LGBT friends” and “being verbally harassed by strangers because you are LGBT.” Respondents rate the distress resulting from each item on a 0 to 5 point scale. If the event did not occur, respondent chose ‘0’, and, if the event did occur, respondents chose a
number between 1 and 5 to indicate how much distress the event caused. For example, if the event occurred and “it bothered [me] not at all,” respondents choose ‘1.’ If the event occurred and “it bothered [me] extremely,” respondents choose ‘5.’ Scores can range from 0 to 250, with higher scores indicating greater levels of minority stress. Balsam and colleagues (2013) reported excellent internal consistency (Cronbach’s α = .97) for the entire measure. Cronbach’s α was .90 in the Sample 1 participants, and Cronbach’s α was .93 in Sample 2 participants, indicating excellent internal consistency reliability in my two samples. This measure can be found in Appendix D.

**Family of Origin Scale.** Hovestadt, Anderson, Piercy, Cochran, and Fine (1985) designed this questionnaire to assess a respondent's perceived autonomy (from) and intimacy (with) one's family of origin. Although autonomy and intimacy are two separate concepts, the Family of Origin Scale has one total score that indicates the overall perceived emotional health of a respondent's family of origin. The 40-item measure includes questions such as, “in my family, it was normal to show both positive and negative feelings,” and “resolving conflicts in my family was a very stressful experience.” Participants respond to each item on a 5-point Likert scale ranging from “strongly agree” to “strongly disagree.” Scores can range from 40 to 200, and higher scores indicate greater levels of autonomy and intimacy with one’s family of origin. In the original study, Hovestadt and colleagues (1985) reported average scores for black participants (\(M = 147.0\)) and white participants (\(M = 144.1\)), and authors of a more recent study reported a similar average score (\(M = 145.7, SD = 29.8\)) for their sample of mostly white (87%) participants (Vanier & Searight, 2012). Hovestadt and colleagues (1985) also reported a two-week test-retest reliability coefficient of .97 and a Cronbach’s \(\alpha\) of .75. The Family of Origin Scale had excellent
internal consistency reliability in the current study, as indicated by Cronbach’s α of .97 in Sample 1 and .98 in Sample 2. This measure can be found in Appendix E.

**Alcohol Use Disorders Identification Test (AUDIT).** Babor, Higgins-Biddle, Saunders and Monteiro (2001) developed this 10-item measure to assess the amount and frequency of one’s drinking and experiences of drinking-related consequences. Total scores vary from 0 to 40, with higher scores indicating a higher level of problem alcohol use. In a review of 18 studies that used the AUDIT, Reinert and Allen (2007) reported a median Cronbach’s α of .83 across all studies, indicating good internal consistency reliability. Cronbach’s α was .85 in Sample 1 participants, and Cronbach’s α was .93 in Sample 2 participants. This measure can be found in Appendix F.

**Drug Use Disorders Identification Test (DUDIT).** Berman Bergman, Palmstierna, and Schlyter (2005) created the 11-item DUDIT based on the structure and content of the AUDIT to screen for drug abuse and dependence. Respondents answer questions regarding the amount and frequency of illicit drug use and experiences of drug-related consequences and receive a score between 0 and 44. Higher scores indicate a higher level of problem drug use. Berman et al. (2005) reported that the DUDIT had good internal consistency reliability, with a Cronbach’s α of .80. Evren, Ovali, Karabulut, and Cetingok (2014) also reported excellent internal consistency reliability (α = .93) in a sample of adolescents and adults diagnosed with substance abuse and dependence. In the current study, Cronbach’s α was .92 in both Samples 1 and 2. This measure can be found in Appendix G.

**Demographics.** Participants provided their age, ethnicity, level of education, school enrollment status, and geographic location. This measure can be found in Appendix H.
RESULTS

Descriptive Analyses

Sample 1. Of the 543 respondents who clicked the link to the study in Sample 1, 535 accepted the informed consent and proceeded to the surveys. I excluded 160 of these cases that had more than 20% data missing from both the AUDIT and DUDIT or at least two of the independent variables. If a case had 20% or more data missing from either the AUDIT or the DUDIT, but had complete data for the other dependent variable and the independent variables, I included that case in the analyses for whichever dependent variable was complete and excluded it from the analyses for the incomplete dependent variable. I also removed 14 participants who labeled themselves “straight.” I excluded 11 cases in the 55 to 64 age range and seven cases in the 65 to 74 age range because these were outliers in the age variable. Additionally, I omitted two cases who labeled themselves as “Trans” or “genderqueer,” indicating their experiences of minority stress might have been related to gender identity, and therefore they did not belong to the population of interest. Finally, I trimmed the AUDIT scores for 7 cases who had scores greater than three standard deviations above the mean AUDIT score.

As Table 1 reveals, of the 341 participants in the final sample for Sample 1, 58% identified as female and 86% identified as white. The sample comprised largely of young participants, with 69% under the age of 35. Participants were equally divided among four of the five sexual orientation groups: 25% lesbian, 23% gay, 25% bisexual, and 23% queer, with the remaining 5% identified as “questioning.” A majority of participants in this sample were highly educated, with 95% having obtained at least some college education. A large proportion of participants (41%) lived in the Midwest.
As seen in Table 2, the average scores on the AUDIT and DUDIT were notably low. Saunders et al. (1993) originally suggested an AUDIT cutoff score of 8 to indicate problem drinking. Reinert and Allen (2007) suggested that a cutoff score of 5 for women would be more appropriate given the consistent research that demonstrated a cutoff score of 8 resulted in high specificity but low sensitivity in detecting hazardous drinking. The average AUDIT score in Sample 1 ($M = 4.6, SD = 4.8$) was lower than even that more conservative threshold, indicating that I recruited a sample of non-problem drinkers. The average DUDIT score in Sample 1 ($M = 2.6, SD = 5.5$) indicated the group also comprised non-problem drug users. Berman and her colleagues (2005) suggested a DUDIT cutoff score of 6 for men and 2 for women to detect problem drug use.

Information about this sample’s level of minority stress, family attachment, and outness can also be seen in Table 2. Participants reported experiencing an average of 17.6 out of the 50 listed experiences included in the Daily Heterosexist Experiences Questionnaire. The average score on the Family of Origin Scale, ($M = 121.0, SD = 32.9$) indicated that Sample 1 participants reported lower levels of perceived family autonomy and intimacy compared to a recent sample of college students cited by Vanier and Searight, 2012 ($M = 145.7, SD = 29.8$), however the authors did not report specifically on LGBQ individuals. Currently, there are no published studies providing information about the Family of Origin Scale with an LBGQ sample for comparison with my sample. The average score on the Outness Inventory in Sample 1 ($M = 4.4, SD = 1.6$) was slightly lower what Sabat and colleagues (2014) reported in their sample of 79 LGB individuals ($M = 4.8, SD = 1.4$). Scores in this range indicate that some people know about the participants’ sexual orientation but it is not often discussed.
Sample 2. During data collection for Sample 2, 192 participants clicked the link to the study, and all of them accepted the informed consent and proceeded to the surveys. I removed five of these cases that were completely missing at least two of the independent variables. If a case had 20% or more data missing from either the AUDIT or the DUDIT, but had complete data for the other dependent variable and the independent variables, that case was included in the analyses for whichever dependent variable was complete and excluded from the analyses for the incomplete dependent variable. I removed one participant who identified as “straight” and one participant who identified as “other” and wrote in “pedosexual.” Additionally, I removed two participants who were in the 65 to 74 year old range because they were outliers in the age variable. I excluded two participants who reported experiencing every one of the 50 possible adverse events listed on the Daily Heterosexist Experiences Questionnaire, which likely indicated either careless responding or severe life circumstances that do not represent those of a typical LGBQ person. Finally, I removed one case that had an AUDIT score higher than 3 standard deviations above the mean and trimmed the AUDIT scores for 3 additional outliers. The respondent with a score higher than 3 standard deviations above the mean that I chose to remove appeared to have a careless response style on several of the measures.

As Table 1 reveals, the 180 participants in Sample 2 were more racially diverse than Sample 1. Sixty-four percent of participants identified as White, compared to 87% in Sample 1. The next largest racial groups in Sample 2 were Black (9%) and bi-racial or multi-racial (9%). Additionally, more participants identified as bisexual (42%) in Sample 2 compared to Sample 1 (25%). This sample comprised of relatively young participants, with 60% under the age of 35. A majority of the participants were also highly educated, with 85% having obtained at least some
college education. Finally, participants in Sample 2 represented all major U.S. geographic locations: Midwest, Northeast, Southeast, Southwest, and West.

As seen in Table 3, the average total AUDIT score in Sample 2 ($M = 7.0$) was higher than the average AUDIT score in Sample 1, but remained below the suggested cutoff of 8 (Saunders, et al., 1993). This suggests that again I recruited a sample of largely non-problem drinkers. The average total DUDIT score in Sample 2 ($M = 7.6$) was above both the recommended cutoff for women (score $\geq 2$) and the recommended cutoff for men (score $\geq 6$), indicating that respondents in Sample 2 reported problem drug use.

Information about this sample’s level of minority stress, family attachment, and outness can also be seen in Table 3. Participants reported experiencing an average of 18.7 out of the 50 listed experiences on the Daily Heterosexist Experiences Questionnaire. Average scores on the Family of Origin Scale ($M = 111.6, SD = 35.5$) were again lower than scores reported in 2012 by Vanier and Searight ($M = 145.7, SD = 29.8$). This may indicate that the samples in the current study had poor perceived family attachment, however, Vanier and Searight (2012) did not report specifically on LGBQ participants. Scores on the Outness Inventory in Sample 2 once again indicated that although people likely knew about participants’ sexual orientation, it was not often talked about.

I conducted a series of $t$-tests to compare reported substance use, minority stress, outness, and family attachment in Sample 1 and Sample 2. There was a significant difference in AUDIT scores for Sample 1 ($M = 4.6, SD = 4.7$) and Sample 2 ($M = 7.0, SD = 8.1$), $t(243) = -3.55, p < .001$, and the difference in DUDIT scores was also significant for Sample 1 ($M = 2.6, SD = 5.5$) and Sample 2 ($M = 7.6, SD = 9.8$), $t(239) = -6.31, p < .001$. The magnitude of these differences, as indicated by effect sizes, between scores in Sample 1 and Sample 2 was small for the AUDIT
(r = .14) and medium for the DUDIT (r = .26). Participants’ average scores on the Outness Inventory were significantly lower for Sample 1 (M = 4.4, SD = 1.6) compared to Sample 2, (M = 4.0, SD = 1.7), t(512) = 2.62, p = .009, although the magnitude of the difference was small (r = .10). Finally, there was a significant difference in scores on the Family of Origin Scale for Sample 1 (M = 120.9, SD = 32.9) and Sample 2 (M = 111.7, SD = 35.1), t(516) = 2.99, p = .003, but again the magnitude of the difference between Samples 1 and 2 was small (r = .14).

**Preliminary Analyses**

Before investigating my hypotheses, I conducted several preliminary analyses with both samples of data to explore the relationships among variables and to evaluate whether the assumptions of linearity, homoscedasticity, multicollinearity, and normality were met for the regression analyses. The residuals scatterplots indicated that the assumptions of linearity and homoscedasticity were met in both Samples 1 and 2.

To assess normality, I analyzed the skew and kurtosis for each measure and visually inspected histograms of the data. In both Sample 1 and Sample 2, the scores for neither the AUDIT nor the DUDIT were normally distributed; therefore, I log-transformed both of these scales. This step reduced the skew and kurtosis for the AUDIT such that the distribution then satisfied the normality assumption. Transforming the DUDIT did not resolve the violation of the normality assumption, so I categorized DUDIT scores into three groups for the regression analyses. The three categories of DUDIT scores were based on a study by Voluse et al. (2012), in which the authors identified a cutoff score of 8 as having the highest sensitivity (.90) and specificity (.85) for identifying drug use problems in a sample of participants engaged in alcohol and/or drug treatment. In the current study, a score of zero on the DUDIT indicated no drug use (64% of Sample 1; 35% of Sample 2), a score between one and seven was interpreted as non-
problem drug use (25% of Sample 1; 30% of Sample 2), and scores of eight and above were interpreted as problem drug use (11% of Sample 1; 35% of Sample 2).

To assess multicollinearity among the predictor variables, I conducted correlation analyses. As examination of Tables 2 and 3 reveals, correlation coefficients and significance levels show that, although many of the variables were significantly correlated, they did not correlate so highly as to indicate multicollinearity ($r \geq .70$).

**Sample 1.** After the preliminary analyses, I conducted a series of ANOVAs to compare each of the demographic variables on total AUDIT scores. In Sample 1, total AUDIT scores differed significantly based on participant age group, Welch’s $F(3, 87) = 9.10, p < .0005$. Specifically, Games-Howell post hoc analyses revealed that AUDIT scores were significantly higher in the 18 to 24 age group ($M = 5.6, SD = 5.2$) than the 35 to 44 age group ($M = 3.1, SD = 2.9$) and the 45 to 54 age group ($M = 2.5, SD = 1.8$). AUDIT scores were also higher in the 25 to 34 age group ($M = 4.2, SD = 4.5$) compared to the 45 to 54 age group ($M = 2.5, SD = 1.8$). Therefore, I included age as a predictor variable in the hierarchal regression model. Total AUDIT scores did not significantly differ in any other demographic variable. I used a series of Chi-square tests for independence to explore each of the demographic variables on the DUDIT category, and found no significant associations. Therefore, I did not include any demographic variables in the logistic regression models predicting DUDIT category.

**Sample 2.** Total AUDIT scores did not differ statistically based on any of the demographic variables in Sample 2 of data collection. However, to maintain consistency and have a regression model comparable to Sample 1, I included participant age as a predictor variable in the first step of the regression model for Sample 2. Again, a series of Chi-square tests
for independence revealed there were no significant associations between DUDIT score categories and age, gender, race/ethnicity, education level, or geographic location in Sample 2.

**Regression Analyses with Alcohol Use as Outcome Variable**

I created a hierarchical multiple regression model to evaluate whether the addition of minority stress, family attachment, and outness improved the prediction of reported alcohol use over and above age alone. I included age as the only predictor of total AUDIT scores in Step 1 of the regression model. In Step 2, I added minority stress, family attachment, and outness. In Step 3, I added the interaction terms: Minority Stress x Family Attachment, Minority Stress x Outness, and Family Attachment x Outness. In Step 4, I added the three-way interaction term: Minority Stress x Family Attachment x Outness. I did not perform post hoc analyses because the interaction terms did not significantly improve the regression model’s prediction of total AUDIT scores.

**Sample 1.** As shown in Table 4, participant age accounted for 3% of the variance in AUDIT scores. Adding the other predictor variables to the model did not improve the model fit, nor did adding the interaction terms in Steps 3 and 4. Although the full regression model significantly predicted total AUDIT scores, the only predictor variable that significantly contributed to the model was participant age.

**Sample 2.** Table 5 shows that in Sample 2, participants’ age accounted for less than 1% of the total variance in reported alcohol use. The addition of minority stress, family attachment, and level of outness in Step 2 yielded a significant regression, accounting for 8.5% of the variance in total AUDIT scores. Neither the interaction terms in Step 3, nor the 3-way interaction term added in Step 4 of the regression, significantly improved the model. Although the full
regression model significantly predicted total AUDIT scores, the only predictor variable that significantly contributed to the regression model was minority stress.

**Regression Analyses with Drug Use as Outcome Variable**

I performed a multinomial logistic regression with the three categories of DUDIT scores (no drug use, non-problem use, problem use) as the outcome variable and three predictor variables (minority stress, family attachment, and level of outness), which I added to the model simultaneously.

**Sample 1.** In Sample 1, a test of the full model with all three predictors against a constant-only model was statistically significant, $\chi^2 (6, N=331) = 19.21, p = .004$, indicating that the predictors could reliably distinguish among the three groups of reported drug use. The Nagelkerke R Square indicated that the full model explained 6.8% of the total variance in total DUDIT scores, and the model correctly classified 63.4% of cases overall. Table 6 shows that for each unit increase in minority stress, participants were 1.4 times more likely to belong to the Problem Drug Use category relative to the No Drug Use category. Additionally, for each unit increase in outness, participants were 1.3 times more likely to belong to the Problem Drug Use category compared to the No Drug Use category. None of the two-way interaction terms, Minority Stress x Family Attachment, Minority Stress x Outness, and Family Attachment x Outness, or the three-way interaction between Minority Stress x Family Attachment x Outness, significantly improved the overall model.

**Sample 2.** In Sample 2, the full model predicting reported drug use was also statistically significant, $\chi^2 (6, N=171) = 26.2, p < .001$, demonstrating that, again, the predictor variables could reliably distinguish among the three drug use categories. The Nagelkerke R Square indicated the full model explained 16.0% of the total variance in total DUDIT scores, and the
model correctly classified 46.2% of cases. Table 7 shows the odds ratios, confidence intervals, and significance values for all predictor variables. According to the logistic regression model, as minority stress increased by one unit, participants were more likely to belong to the Problem Drug Use category compared to the No Drug Use category. Additionally, for each one unit increase in average level of outness, participants were 1.3 times more likely to belong to the Problem Drug Use category compared to the No Drug Use category. Finally, as positive family attachment increased, participants were less likely to be in the Problem Drug Use category relative to participants in the No Drug Use category. Again, none of the interactions between minority stress, family attachment, and outness yielded significant results in the logistic regression.

**Exploratory Analyses with Out to Family Subscale**

To further explore the relationship between outness and alcohol and drug use, I re-ran the regression analyses while substituting the Out to Family subscale (α = .78 in Sample 1 and α = .83 in Sample 2) for the overall Outness Inventory scale. I hypothesized the Out to Family subscale might be more relevant to family attachment; however, using the Out to Family subscale produced patterns similar to the overall Outness Inventory score in each of the regression models. This subscale did not account for any additional variance in AUDIT scores above and beyond age in Sample 1 (b = .04, p = .55) or Sample 2 (b = .03, p = .76). Additionally, none of the interaction terms with the Out to Family subscale were significant predictors of AUDIT scores, comparable to the initial findings when I utilized the full Outness Inventory.

Using the Out to Family subscale, I also re-ran the logistic regression analyses with DUDIT scores as the outcome measure, which yielded similar results to the original regression models with the full Outness Inventory score. In Sample 1, odds ratios indicated that scores on
the Out to Family subscale did not contribute significantly to the model predicting group membership into the three DUDIT score categories. In Sample 2, odds ratios indicated that scores on the Out to Family subscale contributed significantly to the overall regression model comparable to the contribution the full Outness Inventory scores made to the original model. As average scores on the Out to Family subscale increased by one unit, participants were 1.3 times more likely to be in the Problem Drug Use category compared to the No Drug Use category (OR = 1.30, 95% CI: 1.03-1.63, \( p = .03 \)). None of the interaction terms with the Out to Family subscale scores were significant predictors of DUDIT score group membership, similar to the interaction terms using the overall Outness Inventory scores.
DISCUSSION

In the current study, minority stress, as measured by the Daily Heterosexist Experiences Questionnaire (Balsam, Beadnell, & Molina, 2013), was a significant predictor of substance use in three out of four regression models, despite the limited amount of drinking and drug taking in both LGBQ samples. Although minority stress was not a significant predictor of alcohol use in the regression model for Sample 1, it was the only variable in the model that predicted alcohol use in Sample 2. In terms of drug use, minority stress was significantly associated with membership in the Problem Drug Use category compared to the No Drug Use category in both Samples 1 and 2.

To better understand the contribution of minority stress in explaining rates of substance use in LGBQ samples, I compared the effect sizes from the current study to those reported by other researchers who examined factors that contribute to variability in substance use rates in LGBQ individuals. The strength and direction of the relationship between minority stress and substance use in the current study was comparable to these other correlates. For example, Hequembourg and Dearing (2013) found that alcohol use was significantly correlated with participant guilt ($r = -.14, p < .01$), shame ($r = .11, p < .05$) and internalized heterosexism ($r = .14, p < .01$). In the current study, minority stress had a stronger association with alcohol use in Sample 2 ($r = .22, p < .01$) compared to guilt, shame, and internalized heterosexism cited in Hequembourg and Dearing (2013). Researchers have also correlated personality characteristics with variability in substance use rates in LGB individuals (Livingston, Oost, Heck, & Cochran, 2014). Specifically, higher AUDIT scores were significantly associated with lower conscientiousness ($r = -.12, p < .01$), higher extraversion ($r = .09, p < .05$), and higher neuroticism ($r = .09, p < .05$). Using the Drug Abuse Screening Test-10 (Skinner & Goldberg,
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1986) to assess drug taking, Livingston et al. (2014) also found that lower conscientiousness ($r = -.14, p < .001$), higher extraversion ($r = .12, p < .01$), and higher openness to experience ($r = .09, p < .05$) were all significantly associated with higher reported drug use by sexual minorities. Again, in the current study, effect sizes indicate that the association of minority stress and substance use was comparable to the personality factors cited by Livingston and colleagues (2014).

The effect sizes in the current study are small in comparison to common factors researchers use to explain variability in substance use rates, such as age and gender. However, researchers should continue to identify the correlates of substance use among LGBQ individuals because these common factors do not explain the disparity in substance use rates between LGBQ and non-LGBQ people. For example, researchers recently examined correlates of substance use in a large community sample ($N = 6,435$) and found that the factors significantly associated with increased substance use in the full sample, such as poor emotional health, younger age, and male gender, still did not account for the disproportionately higher rates of substance use in the gay/bisexual subgroup compared to the heterosexual subgroup (Lanfear, Atkins, & Mosher, 2013). Researchers should continue to examine the potential factors, such as minority stress, that explain the remaining disparity between LGBQ and non-LGBQ individuals.

My second hypothesis, that positive family attachment would interact with minority stress to reduce the association between minority stress and substance use, was not supported by the data. As shown in Tables 2 and 3, positive family attachment was significantly correlated with lower levels of minority stress, but the interaction of these two variables did not significantly predict alcohol or other drug use. In Sample 2, participants who reported higher scores on the Family of Origin Scale were more likely to be in the No Drug Use category.
compared to the Problem Drug Use category. In sum, the relationship between family attachment and reported substance use was unexpectedly weak in the current samples.

My third hypothesis, that participants’ level of outness would interact with family attachment and further reduce the correlation between minority stress and substance use, was also not supported. Contrary to my hypothesis, in both Samples 1 and 2, as participants’ level of outness increased by one unit, they were approximately 1.3 times more likely to be in the Problem Drug Use category compared to the No Drug Use category.

The results in the current study differ from previous research in a few notable ways. First, although two previous studies found that positive family attachment was correlated with lower substance use in LGBQ samples (Padilla et al., 2010; Taylor, 2010), positive family attachment was not associated with decreased substance use in three of my four regression models. Second, participants with a higher level of outness were more likely to be problem drug users than non-drug users, which conflicts with research that suggests being out leads to better mental health outcomes (Feldman & Wright, 2013; Meyer, 2003, 2012).

There are several potential explanations for these unexpected findings, including (a) lower rates of substance use in the current sample; (b) issues with recruitment techniques and/or sample characteristics; (c) measurement error; (d) the lack of any meaningful relationship of minority stress, outness and family attachment with substance use by LGBQ people; and (e) other factors not measured in the current study that explain the relationship between minority stress and substance use.

The first of these explanations is that the participants in the current study reported lower rates of alcohol and drug use compared to what other researchers have identified in LGBQ samples (Cochran et al., 2000; Hequembourg & Dearing, 2013; Reed, Prado, Matsumoto, &
Amaro, 2010), and this precluded finding a genuine relationship between variables. As recently as 2013, Hequembourg and Dearing reported an average AUDIT score of 10.9 in their sample of 389 LGB participants, but the average AUDIT scores were only 4.6 in Sample 1 and 6.9 in Sample 2 in my current study. Additionally, Hequembourg and Dearing (2013) reported that 50.4% of their sample was categorized in the hazardous drinking range (AUDIT scores between 8 and 19), but only 15.4% (Sample 1) and 19.0% (Sample 2) of my participants had AUDIT scores between 8 and 19. In 2010, Reed and colleagues reported 33% of LGB college students surveyed admitted to past-month drug use, but only 21.5% of my participants who were enrolled in college reported illicit drug use at least monthly. It is possible that the relationships between substance use, family attachment, and outness would be stronger if my samples had contained a larger proportion of problem drinkers and drug users.

There are two potential explanations for the unexpectedly low rates of substance use in the current samples. The first assumes my samples are representative of the wider LGBQ community and suggests that LGBQ people are actually using substances at lower rates compared to previously published studies (Cochran et al., 2000; Hequembourg & Dearing, 2013; King et al., 2008; Marshal et al., 2008; McCabe et al., 2010; Reed et al., 2010). Changing cultural norms during the past several years that have increased the acceptability of LGBQ people could have led to a reduction in substance use in the LGBQ population. As one example of changing cultural norms, during data collection for the current study (April through June, 2015), the Supreme Court of the United States ruled that same-sex marriage is legal in all 50 states (Obergefell v. Hodges, 2015). If substance use rates among LGBQ people are decreasing, the increase in visibility and participation in culturally normative life events could be one
potential factor contributing to improvements in the mental health of LGBQ people, including lower rates of substance use.

In addition to the largely positive sociocultural changes for sexual minorities, LGBQ people may not be using substances to manage the minority stress they do experience. Recent research indicates factors such as hope, optimism, and social support within the LGBQ community promote resiliency and a decrease in mental health problems (Kwon, 2013). Challenges that LGBQ people face, such as prejudice, discrimination, and homophobia, may create opportunities for growth and resiliency, and researchers are starting to explore a strengths-based approach to understanding the LGBQ community (Herrick, Stall, Goldhammer, Egan, & Mayer, 2014; Kwon, 2013).

The other potential explanation for lower rates of substance use in the current study is that the samples were not representative of the LGBQ community, perhaps because of how I recruited participants. In Sample 1, the largest proportion of participants learned of the study from Facebook. I targeted Facebook groups that were associated with the LGBTQ community and posted the study announcement on their front page. Many of the organizations I contacted served young LGBT people and/or people who had access to technology. The resulting sample was mostly young (nearly 40% between the ages of 18 and 24), had computer access, and was connected to an online LGBT community. Meyer (2003, 2012) identified connectedness to the LGBT community as a protective factor for psychosocial stress because it provides access to social support and within-group pride (Frost & Meyer, 2013; Meyer, 2003, 2012). Additionally, sending my recruitment materials to LGBQ websites in Sample 1 appears to have attracted participants who were open about their sexual orientation in at least some contexts.
Given these potential limitations of the participants recruited for Sample 1, I collected a second sample of participants using Craigslist, a classified ad website. This site allows users to browse various classified ads and interact with others anonymously. I assumed that the anonymity would allow LGBQ people who were not as comfortable being open about their sexual orientation to participate in the study. Just as importantly, I hoped that the second sample would report higher levels of drinking and drug taking. Participants in Sample 2 did in fact have a lower average level of outness compared to Sample 1, as shown by an independent samples t-test; however, the magnitude of the difference between scores was small. Also, participants in Sample 2 reported significantly higher rates of alcohol and drug use compared to participants in Sample 1, although these rates were still lower than those of previous studies (Hequembourg & Dearing, 2013; Marshal et al., 2008; McCabe et al., 2010; Reed et al., 2010).

In addition to having recruited participants with lower than expected rates of substance use, other demographic characteristics, particularly the age of participants, could have contributed to the unexpectedly weak relationship between family attachment and substance use. The modal age band for the overall sample was between 25 and 34 years old, which could indicate that the majority of participants were socially and financially independent of their families of origin. As LGBQ people age, family attachment may have less impact on their well-being if the family of origin is no longer the primary source of social support. Some researchers who have concluded family support is a protective factor for substance use studied adolescent samples (Goldbach et al., 2014; Padilla et al., 2010; Taylor, 2010). The results of the current study, which suggest a weak relationship between family attachment and substance use, could indicate that family support is not as strong a protective factor in adult LGBQ populations.
Measurement error is the third potential explanation for the unexpected results of the current study, particularly in regards to outness. The Outness Inventory (Mohr & Fassinger, 2000) was the only measure of outness that was validated at the time of this study, but there are several limitations of this measure. First, the authors of the measure assume that talking with others about one’s sexual orientation indicates a higher level of outness. For example, the response, “…definitely knows about your sexual orientation, but it is rarely talked about” receives a score of 5, and the response, “…definitely knows about your sexual orientation, and it is openly talked about” receives a score of 7. Although the amount a person talks about his or her sexual orientation may be related to how out he or she is, it is plausible that someone could be out and choose not talk about his or her orientation to certain people. For example, an LGBQ person may not talk about his or her sexuality with grandparents, even if the grandparents know about their orientation, just as a heterosexual person may also choose not to talk about sexuality with grandparents.

To address this and other limitations of the Outness Inventory, Meidlinger and Hope (2014) created the Nebraska Outness Scale. This measure has two subscales that assess how much respondents disclose and how much they conceal their sexual orientation (Meidlinger & Hope, 2014). Meidlinger and Hope (2014) reported that concealment and disclosure were two distinct constructs, and that concealment was more closely related to overall well-being in LGBQ individuals than disclosure. This measure was not yet available at the time I designed the current study, but future studies using the Nebraska Outness Scale may find a significant interaction between concealment and minority stress.

A fourth potential explanation for the unanticipated results in the current study is that outness may not actually interact with family attachment and moderate the relationship between
minority stress and substance use. Although two research teams found no significant relationship between outness and mental health (Brady & Buse, 1994; Frost & Meyer, 2009), I think it unlikely that these variables are wholly unrelated. There is a growing body of literature that suggests the relationship between outness and mental health depends on many individual and contextual factors such as social support, geographic location, and religious beliefs (Legate, Ryan & Weinstein, 2012; McGarrity & Huebner, 2014; Pachankis, Cochran, & Mays, 2015; Sabat et al., 2014). Therefore, it may be difficult to capture the “net effect” of an LGBQ person’s level of outness, which could be manifested in the current study as a lack of relationship between outness and the outcome variables.

Gender is one example of a factor that could alter the association between outness and mental health. Pachankis and his colleagues (2015) reported that LBQ women who were open about their sexual orientation reported lower rates of anxiety and depression in the previous year than GBQ men who were open about their sexual orientation. The authors attributed this finding to gender-based differences in the social acceptability of being LGBQ in the U.S., and they suggested that gay and bisexual men experience higher levels of minority stress compared to lesbian and bisexual women (Pachankis et al., 2015).

In another study, researchers identified socioeconomic status as a factor that moderated the relationship between outness and perceived discrimination in a sample of gay and bisexual men. Men from low-socioeconomic backgrounds who were more open about their sexual orientation reported higher levels of perceived anti-gay discrimination than men who were open about their sexual orientation but came from high-socioeconomic backgrounds (McGarrity and Huebner, 2014).
The minority stress model (Meyer, 1995, 2003) proposes other socioeconomic and psychological characteristics that could help explain the relationship between minority stress and substance use that I did not measure in the current study. As one example, LGBQ individuals who live in poverty may be more prone to both experiencing minority stress due to their disadvantaged socioeconomic status and thus are more likely to develop substance use disorders. As another example, if I had measured participants’ mood, perhaps those who reported anxiety or sadness would have also reported higher minority stress and/or lower family attachment, thereby changing the association of those variables and substance use.

Researchers have also identified factors associated with increased substance use in LGBQ individuals that are not identified in the minority stress model, such as internalizing/externalizing behavior (Goldbach et al., 2014), personality factors (Livingston, et al., 2014), religiosity (Rotosky, Danner, & Riggle, 2010), and the compounding effect of having multiple minority identities (Balsam et al., 2015; Mereish & Bradford, 2014). For example, in a meta-analytic review, Goldbach and his colleagues (2014) found that gay-related victimization was associated with higher rates of substance use, but general victimization, not strictly related to an individual’s gay identity, was a much better predictor of substance use.

An important area of research in LGBQ studies focuses on how multiple and intersecting minority identities can affect mental health (Balsam et al., 2015; Bostwick, Hughes, Boyd, West, & McCabe, 2014; Mereish & Bradford, 2014). Balsam and her colleagues (2015) noted that there are major gaps in the literature regarding the mental health of racially and ethnically diverse sexual minorities. Mereish and Bradford (2014) reported that if a participant identified as female, a sexual minority, and a racial minority, she had significantly higher rates of substance use compared to individuals who identified with one minority group. Similarly, Bostwick and
colleagues (2014) found that participants who had experienced discrimination based on multiple minority identities were more likely to meet criteria for a past-year mood disorder than participants who experienced discrimination based on only one minority identity. Although I collected information about participant race in the current study, I did not plan to measure the impact of intersecting identities, and therefore did not have the statistical power to examine potential interactions.

**Future Directions**

I have several suggestions for future research to improve our understanding of the association between minority stress and substance use. First, based on the unexpectedly low rates of substance use in my samples, I recommend research to examine whether substance use has decreased in LGBQ populations in the past several years. If rates have decreased, I recommend assessing the factors that are contributing to this trend, such as resiliency in the LGBQ community, perceived social acceptance of LGBQ individuals, and the perception of substance use in the LGBQ community. Second, I suggest identification of the strategies LGBQ individuals use to manage minority stress aside from using substances. Emerging literature indicates a trend toward exploring the positive outcomes of managing minority stress (Herrick et al., 2014; Kwon, 2013), which may provide important information about the relationship between minority stress and substance use that cannot be explained by a theoretical framework focused on deficits and problems in the LGBQ community. Finally, future research should explore the impact of multiple minority identities, including other oppressed or stigmatized identities, on the relationship between minority stress and substance use.
REFERENCES


lesbian, gay and bisexual people. *BioMed Central Psychiatry* 8(70).


need-to-know.


Sexual orientation, gender, race, and lifetime substance use problems. *Journal of Studies on Alcohol and Drugs*, 75, 179-188.


APPENDIX A: STUDY ANNOUNCEMENT

Hi everyone! Please consider participating in my dissertation study that looks at sexual orientation, the stress of being a sexual minority, drug and alcohol use, and family relationships. I am looking for people who are at least 18, Trans* or cis, and identify as lesbian, gay, bisexual, queer, or questioning to fill out some surveys that will take 15-20 minutes. Thanks very much for your help!

[survey link]
APPENDIX B: SEXUAL ORIENTATION MEASURE

1. What is your gender?
   a. Female
   b. Male
   c. Trans*
   d. Genderqueer
   e. Other: ________________

2. Please check which describes you best:
   a. Lesbian
   b. Gay
   c. Bisexual
   d. Queer
   e. Questioning
   f. Straight

3. Who are you romantically and sexually attracted to MOST of the time:
   O  O  O  O  O  O  O

   People of the same sex  People of the same sex and opposite sex equally  People of the opposite sex

4. With whom have you engaged in sexual behavior? Sexual behavior includes: romantic kissing, touching, rubbing genitals, engaging in oral sex (touching a partner’s genitals with your mouth and vice versa), anal sex (when one partner penetrates the other partner’s anus, rectum or butt with a penis or finger(s)), or vaginal sex (when one partner penetrates a woman’s vagina with a penis or finger(s))?

   O  I have not engaged in sexual behavior

   O  O  O  O  O  O  O

   People of the same sex  People of the same sex and opposite sex equally  People of the opposite sex

5. If you are currently involved in a romantic relationship, is that person:
   a. The opposite sex as you.
   b. The same sex as you.
APPENDIX C: OUTNESS INVENTORY

Use the following rating scale to indicate how open you are about your sexual orientation to the people listed below.

0 = not applicable to your situation; there is no such person or group of people in your life
1 = definitely does NOT know about your sexual orientation
2 = might know about your sexual orientation, but it is never talked about
3 = probably knows about your sexual orientation, but it is never talked about
4 = probably knows about your sexual orientation, but it is rarely talked about
5 = definitely knows about your sexual orientation, but it is rarely talked about
6 = definitely knows about your sexual orientation, and it is sometimes talked about
7 = definitely knows about your sexual orientation, and it is openly talked about

1. Mother
2. Father
3. Siblings (sisters, brothers, step-siblings)
4. Extended family/relatives (grandparents, aunts, uncles, cousins)
5. My NEW straight friends
6. My work peers
7. My work supervisor(s)
8. Members of my religious community (e.g. church, temple)
9. Leaders of my religious community (e.g. pastor, rabbi)
10. Strangers, new acquaintances
11. My OLD straight friends

Additional Questions:
1. Do you use social media?
   a. Yes
   b. No
2. If yes, are you out in the following places?
   a. Facebook [yes, no, sometimes, n/a]
   b. Twitter [yes, no, sometimes, n/a]
   c. Instagram [yes, no, sometimes, n/a]
   d. YouTube [yes, no, sometimes, n/a]
   e. Tumblr [yes, no, sometimes, n/a]
   f. Pinterest [yes, no, sometimes, n/a]
   g. Other ________ [yes, no, sometimes, n/a]
   h. Other ________ [yes, no, sometimes, n/a]
3. Are you out in online forums (e.g. blogs, comments, chat rooms)
   a. Yes
   b. No
   c. Sometimes
APPENDIX D: DAILY HETEROSEXIST EXPERIENCES QUESTIONNAIRE

The following is a list of experiences that LGBT people sometimes have. Please read each one carefully, and then respond to the following question:

How much has this problem distressed or bothered you during the past 12 months?

0 = Did not happen/not applicable to me
1 = It happened, and it bothered me NOT AT ALL
2 = It happened, and it bothered me A LITTLE BIT
3 = It happened, and it bothered me MODERATELY
4 = It happened, and it bothered me QUITE A BIT
5 = It happened, and it bothered me EXTREMELY

1. Difficulty finding a partner because you are LGBT
2. Difficulty finding LGBT friends
3. Having very few people you can talk to about being LGBT
4. Watching what you say and do around heterosexual people
5. Hearing about LGBT people you know being treated unfairly
6. Hearing about LGBT people you don't know being treated unfairly
7. Hearing about hate crimes (e.g., vandalism, physical or sexual assault) that happened to LGBT people you don't know
8. Being called names such as "fag" or "dyke"
9. Hearing other people being called names such as "fag" or "dyke"
10. Hearing someone make jokes about LGBT people
11. Family members not accepting your partner as a part of the family
12. Your family avoiding talking about your LGBT identity
13. Your children being rejected by other children because you are LGBT
14. Your children being verbally harassed because you are LGBT
15. Feeling like you don't fit in with other LGBT people
16. Pretending that you have an opposite-sex partner
17. Pretending that you are heterosexual
18. Hiding your relationship from other people
19. People staring at you when you are out in public because you are LGBT
20. Worry about getting HIV/AIDS
21. Constantly having to think about "safe sex"
22. Feeling invisible in the LGBT community because of your gender expression
23. Being harassed in public because of your gender expression
24. Being harassed in bathrooms because of your gender expression
25. Being rejected by your mother for being LGBT
26. Being rejected by your father for being LGBT
27. Being rejected by a sibling or siblings because you are LGBT
28. Being rejected by other relatives because you are LGBT
29. Being verbally harassed by strangers because you are LGBT
30. Being verbally harassed by people you know because you are LGBT
31. Being treated unfairly in stores or restaurants because you are LGBT
32. People laughing at you or making jokes at your expense because you are LGBT
33. Hearing politicians say negative things about LGBT people
34. Avoiding talking about your current or past relationships when you are at work
35. Hiding part of your life from other people
36. Feeling like you don't fit into the LGBT community because of your gender expression
37. Difficulty finding clothes that you are comfortable wearing because of your gender expression
38. Being misunderstood by people because of your gender expression
39. Being treated unfairly by teachers or administrators at your children’s school because you are LGBT
40. People assuming you are heterosexual because you have children
41. Being treated unfairly by parents of other children because you are LGBT
42. Difficulty finding other LGBT families for you and your children to socialize with
43. Being punched, hit, kicked, or beaten because you are LGBT
44. Being assaulted with a weapon because you are LGBT
45. Being raped or sexually assaulted because you are LGBT
46. Having objects thrown at you because you are LGBT
47. Worrying about infecting others with HIV
48. Other people assuming that you are HIV positive because you are LGBT
49. Discussing HIV status with potential partners
50. Worrying about your friends who have HIV
APPENDIX E: FAMILY OF ORIGIN SCALE

Please answer to the following statements using the responses below. “Family” refers to the adults who raised you during childhood (parents/guardians/adoptive parents/grandparents) and other children who lived with you, if any (brothers, sisters).

1= Strongly Disagree
2= Disagree
3= Neutral
4= Agree
5= Strongly Agree

1. In my family, it was normal to show both positive and negative feelings.
2. The atmosphere in my family usually was unpleasant.
3. In my family, we encouraged one another to develop new friendships.
4. Differences of opinion in my family were discouraged.
5. People in my family often made excuses for their mistakes.
6. My parents encouraged family members to listen to one another.
7. Conflicts in my family never got resolved.
8. My family taught me that people were basically good.
9. I found it difficult to understand what other family members said and how they felt.
10. We talked about our sadness when a relative or family friend died.
11. My parents openly admitted it when they were wrong.
12. In my family, I expressed just about any feeling I had.
13. Resolving conflicts in my family was a very stressful experience.
14. My family was receptive to the different ways various family members viewed life.
15. My parents encouraged me to express my views openly.
16. I often had to guess at what other family members thought or how they felt.
17. My attitudes and feelings frequently were ignored or criticized in my family.
18. My family members rarely expressed responsibility for their actions.
19. In my family, I felt free to express my own opinions.
20. We never talked about our grief when a relative or family member died.
21. Sometimes in my family, I did not have to say anything but I felt understood.
22. The atmosphere in my family was cold and negative.
23. The members of my family were not very receptive to one another’s views.
24. I found it easy to understand what other family members said and how they felt.
25. If a family friend moved away, we never discussed our feelings of sadness.
26. In my family, I learned to be suspicious of others.
27. In my family, I felt that I could talk things out and settle conflicts.
28. I found it difficult to express my own opinions in my family.
29. Mealtimes in my home usually were friendly and pleasant.
30. In my family, no one cared about the feelings of other family members.
31. We usually were able to work out conflicts in my family.
32. In my family, certain feelings were not allowed to be expressed.
33. My family believed that people usually took advantage of you.
34. I found it easy in my family to express what I thought and how I felt.
35. My family members usually were sensitive to one another’s feelings.
36. When someone important to us moved away, our family discussed our feelings.
37. My parents discouraged us from expressing views different from theirs.
38. In my family, people took responsibility for what they did.
39. My family had an unwritten rule: don’t express your feelings.
40. I remember my family as being warm and supportive.
APPENDIX F: ALCOHOL USE DISORDERS IDENTIFICATION TEST

Please answer the following questions. Remember your responses are anonymous.

1. How often do you have a drink containing alcohol?
   Never
   Monthly or less
   2-4 times a month
   2-3 times a week
   4 or more times a week

2. How many standard drinks containing alcohol (one 12 oz. beer, one 5 oz. glass of wine, one 1.5 oz. shot of hard liquor) do you have on a typical day when you are drinking?
   1 or 2
   3 or 4
   5 or 6
   7 to 9
   10 or more

3. How often do you have six or more drinks on one occasion?
   Never
   Less than monthly
   Monthly
   Weekly
   Daily or almost daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?
   Never
   Less than monthly
   Monthly
   Weekly
   Daily or almost daily

5. How often during the last year have you failed to do what was normally expected of you because of drinking?
   Never
   Less than monthly
   Monthly
   Weekly
   Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
   Never
7. How often during the last year have you had a feeling of guilt or remorse after drinking?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because of your drinking?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

9. Have you or someone else been injured because of your drinking?
   - No
   - Yes, but not in the last year
   - Yes, during the last year

10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?
    - No
    - Yes, but not in the last year
    - Yes, during the last year
Here are a few questions about drugs. Please answer as correctly and honestly as possibly by indicating which answer is right for you. Remember that your answers are anonymous.

**List of Drugs (Note! Not alcohol)**

**Cannabis:** marijuana, hash, hash oil

**Amphetamines:** methamphetamine, phenmetraline, khat, betel nut, ritaline (methylylphenidate)

**Cocaine:** crack, freebase, coca leaves

**Opiates:** smoked heroin, heroin, opium

**Hallucinogens:** ecstasy, LSD (lysergic acid), mescaline, peyote, PCP, angel dust, (Phencyclidine), psilocybin, DMT (dimethyltryptamine)

**Solvents/Inhalants:** thinner, trichloroethylene, gasoline/petrol, gas, solution, glue

**GHB and others:** GHB, anabolic steroids, laughing gas (halothane), amyl nitrate (poppers) anticholinergic compounds

**Pills- Medicines**

**Pills count as drugs when you take**
- more of them or take them more often than the doctor has prescribed for you
- pills because you want to have fun, feel good, get “high”, or wonder what sort of effect they have on you
- pills that you have received from a relative or friend
- pills that you have bought on the “black market” or stolen

**Sleeping pills/sedatives:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Alprazolam</th>
<th>Amobarbital</th>
<th>Apodorm</th>
<th>Apozepam</th>
<th>Aprobarbital</th>
<th>Butabarbital</th>
<th>Butalbital</th>
<th>Chloral hydrate</th>
<th>Diazepam</th>
<th>Dormicum</th>
<th>Ethchlorvynol</th>
<th>Fenemal</th>
<th>Flunitrazepam</th>
<th>Fluscand</th>
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<tr>
<td>Glutethimide</td>
<td>Halcion</td>
<td>Heminevrin</td>
<td>Iktorivil</td>
<td>Imovane</td>
<td>Mephobarbital</td>
<td>Meprobamate</td>
<td>Methaqualone</td>
<td>Methohexital</td>
<td>Mogadon</td>
<td>Nitrazepam</td>
<td>Oxascand</td>
<td>Pentobarbital</td>
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**Painkillers:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Actiq</th>
<th>Citodon forte</th>
<th>Dexodon</th>
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<tbody>
<tr>
<td></td>
<td>Coccilana-Etyfin</td>
<td>Depolan</td>
<td>Dexofen</td>
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<td>Drug Name</td>
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<tr>
<td>Dolcontin</td>
<td>Maxidon</td>
<td>Panocod forte</td>
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<td>Doleron</td>
<td>Metado</td>
<td>Temgesic</td>
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<tr>
<td>Dolotard</td>
<td>Morfin</td>
<td>Tiparol</td>
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<tr>
<td>Doloxene</td>
<td>Nobligan</td>
<td>Tradolan</td>
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<td>Durogesic</td>
<td>Norflex</td>
<td>Tramadol</td>
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<tr>
<td>Fentanyl</td>
<td>Norgesic</td>
<td>Treo comp</td>
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<tr>
<td>Ketodur</td>
<td>Opidol</td>
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<td>Ketogan</td>
<td>OxyNorm</td>
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<tr>
<td>Kodein</td>
<td>OxyContin</td>
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</table>
*Pills do NOT count as drugs if they have been prescribed by a doctor and you take them in the prescribe dosage.

1. How often do you use drugs other than alcohol? (see list of drugs below)
   - Never
   - Once a month or less
   - 2-4 times a month
   - 2-3 times a week
   - 4 times a week or more often

2. Do you use more than one type of drugs on the same occasion?
   - Never
   - Once a month or less
   - 2-4 times a month
   - 2-3 times a week
   - 4 times a week or more often

3. How many times do you take drugs on a typical day when you use drugs?
   - 0
   - 1-2
   - 3-4
   - 5-6
   - 7 or more

4. How often are you influenced heavily by drugs?
   - Never
   - Less often than once a month
   - Every month
   - Every week
   - Daily or almost every day

5. Over the past year, have you felt that your longing for drugs was so strong that you could not resist it?
   - Never
   - Less often than once a month
   - Every month
   - Every week
   - Daily or almost every day

6. Has it happened, over the past year, that you have not been able to stop taking drugs once you started?
   - Never
   - Less often than once a month
   - Every month
   - Every week
   - Daily or almost every day
7. How often over the past year have you taken drugs and then neglected to do something you should have done?
   - Never
   - Less often than once a month
   - Every month
   - Every week
   - Daily or almost every day

8. How often over the past year have you needed to take a drug the morning after heavy drug use the day before?
   - Never
   - Less often than once a month
   - Every month
   - Every week
   - Daily or almost every day

9. How often over the past year have you had guilt feelings or a bad conscience because you used drugs?
   - Never
   - Less often than once a month
   - Every month
   - Every week
   - Daily or almost every day

10. Have you or anyone else been hurt (mentally or physically) because you used drugs?
    - No
    - Yes, but not over the past year
    - Yes, over the past year

11. Has a relative or friend, a doctor or nurse, or anyone else, been worried about your drug use or said to you that you should stop using drugs?
    - No
    - Yes, but not over the past year
    - Yes, over the past year
APPENDIX H: DEMOGRAPHICS QUESTIONNAIRE

1. Age:

2. Ethnicity:
   - African American
   - Asian American
   - White
   - Hispanic/ Latino
   - American Indian
   - Bi-racial/multi-racial
   - Other _____________

3. Education Level:
   - Some High School
   - High School Diploma
   - Some College
   - Associate’s Degree
   - Bachelor’s Degree
   - Master’s Degree
   - Doctoral Degree
   - Other _____________

4. Are you currently enrolled in school? Y/ N

5. Geographic Location:
   - **Northeast:** (Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, New York, Delaware, Washington D.C., Maryland, Pennsylvania)
   - **Southeast:** (Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, Alabama, Georgia, Florida, West Virginia, Virginia, North Carolina, South Carolina)
   - **Midwest:** (North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Michigan, Ohio)
   - **Southwest:** (Arizona, New Mexico, Texas, Oklahoma)
   - **West:** (Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Utah, Colorado, Alaska, Hawaii)

6. Do you currently live in a state where you could legally marry someone of the same gender?
   - a. Yes
   - b. No
   - c. I don’t know
Introduction: My name is Justine Ray, and I am a graduate student conducting this study as part of my Doctoral degree in the Department of Psychology at Bowling Green State University in Bowling Green, Ohio. The research advisors for this study are Harold Rosenberg, Ph.D. and Carolyn Tompsett, Ph.D. The purpose of this project is to study the relationship between the stress of being a sexual minority and alcohol and drug use.

Purpose: The purpose of this study is to learn more about the experiences of people who identify as lesbian, gay, bisexual, queer, or questioning in regards to family history, the stress related to being a sexual minority, and alcohol and drug use.

Procedure: If you choose to participate in this study, you will be asked to answer questions in an online survey format. Completion of the surveys will take approximately 15-20 minutes, and questions will cover topics such as sexual orientation, alcohol and drug use, information about your family, and experiences of discrimination and prejudice.

Benefits: If you choose to participate in the study, you will contribute to a researchers' knowledge of the unique, and sometimes stressful, experiences of LGBQ people. There is no financial incentive or compensation for participation.

Potential Risks: Risks associated with participation are minimal. However, you may experience discomfort associated with answering questions about your sexual orientation, experience of discrimination, family history, and substance use. To reduce this risk, I will not ask you to provide your name with your responses. If you become too uncomfortable, you may stop participation at any time.

Voluntary nature: Your participation is completely voluntary. You are free to withdraw at any time. You may decide to skip questions or discontinue participation at any time without penalty. Deciding to participate or not will not impact any relationship you might have with Bowling Green State University.

Anonymity: All responses collected during this study will be anonymous, and your name will not be collected at any time. Data will be stored in an encrypted web-based server, and only my research advisors and myself will have access to the information collected. Results of the study will be presented only after the data has been combined and analyzed. Because this study is electronic, please be aware that some employers may use tracking software and so you may want to complete your survey on a personal computer. In addition, you may not want to leave the survey open if you are using a public computer or a computer others may have access to. You also may want to clear your browser cache and page history after completing the survey.

Contact information: If you have any questions about this research, about your participation in this research, or would like a printed copy of this consent form, please contact me (440-724-7959) or by email [justray@bgsu.edu]. You may also contact my advisors, Harold Rosenberg, Ph.D. [419-372-7255; hrosenb@bgsu.edu], or Carolyn Tompsett, Ph.D. [419-372-8256; cjtomps@bgsu.edu]. Additionally, you may contact the Chair of the Bowling Green State University, Human Subjects Review Board at 419-372-7716 or hsrp@bgsu.edu, if you have any questions about your rights as a participant in this research.

Thank you for your valuable time!

I have been informed of the purposes, procedures, risks and benefits of this study, and I have been informed that my participation is completely voluntary.

AGREE

DISAGREE
Figure 1. Predicted relationship between variables.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sample 1 (N= 341)</th>
<th>Sample 2 (N= 180)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>198 (58.8)</td>
<td>99 (55.0)</td>
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<tr>
<td>Male</td>
<td>90 (26.7)</td>
<td>64 (35.6)</td>
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<tr>
<td>Trans</td>
<td>27 (8.0)</td>
<td>3 (1.7)</td>
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<tr>
<td>Other (genderqueer)</td>
<td>22 (6.5)</td>
<td>14 (8.0)</td>
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<tr>
<td><strong>Sexual Orientation</strong></td>
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<td></td>
</tr>
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<td>Lesbian</td>
<td>83 (24.6)</td>
<td>37 (20.6)</td>
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<tr>
<td>Gay</td>
<td>78 (23.1)</td>
<td>43 (23.9)</td>
</tr>
<tr>
<td>Bisexual</td>
<td>83 (24.6)</td>
<td>76 (42.2)</td>
</tr>
<tr>
<td>Queer</td>
<td>78 (23.1)</td>
<td>17 (9.4)</td>
</tr>
<tr>
<td>Questioning</td>
<td>15 (4.5)</td>
<td>7 (3.9)</td>
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<tr>
<td><strong>Age</strong></td>
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<td></td>
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<tr>
<td>18-24</td>
<td>132 (38.7)</td>
<td>56 (31.1)</td>
</tr>
<tr>
<td>25-35</td>
<td>100 (29.3)</td>
<td>52 (28.9)</td>
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<td>35-44</td>
<td>37 (10.9)</td>
<td>17 (9.4)</td>
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<td>45-54</td>
<td>18 (5.3)</td>
<td>17 (9.4)</td>
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<td>55-64</td>
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<tr>
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<td>22 (12.2)</td>
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<tr>
<td><strong>Race</strong></td>
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<tr>
<td>Caucasian/White</td>
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<tr>
<td>African</td>
<td>6 (1.8)</td>
<td>17 (9.4)</td>
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<tr>
<td>American/Black</td>
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</tr>
<tr>
<td>Asian American</td>
<td>7 (2.1)</td>
<td>6 (3.3)</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>2 (0.6)</td>
<td>2 (1.1)</td>
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<tr>
<td>Bi-racial/Multi-racial</td>
<td>8 (2.4)</td>
<td>17 (9.4)</td>
</tr>
<tr>
<td>Other (Arab American)</td>
<td>5 (1.5)</td>
<td>1 (0.6)</td>
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<tr>
<td><strong>Education</strong></td>
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<tr>
<td>No College</td>
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<td>27 (15.3)</td>
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<tr>
<td>Some College/Undergraduate</td>
<td>233 (68.3)</td>
<td>123 (69.5)</td>
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<tr>
<td>Post-Undergraduate</td>
<td>89 (26.0)</td>
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<td><strong>Geographic Location</strong></td>
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<td></td>
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<td>Northeast</td>
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<td>Southeast</td>
<td>35 (10.6)</td>
<td>36 (20.5)</td>
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<tr>
<td>Midwest</td>
<td>134 (40.6)</td>
<td>41 (23.3)</td>
</tr>
<tr>
<td>Southwest</td>
<td>31 (9.4)</td>
<td>21 (11.9)</td>
</tr>
<tr>
<td>West</td>
<td>60 (18.2)</td>
<td>39 (22.2)</td>
</tr>
</tbody>
</table>
Table 2

Correlations/Associations, Means and Standard Deviations of Predictors and Outcomes, Sample 1

<table>
<thead>
<tr>
<th>1. Age (1=18-24, 2=25-34, 3=35-44, 4=45-54)</th>
<th>2. Education Level</th>
<th>3. Gender</th>
<th>4. Geographic Location</th>
<th>5. Race/Ethnicity</th>
<th>6. AUDIT&lt;sup&gt;d&lt;/sup&gt;</th>
<th>7. DUDIT&lt;sup&gt;e&lt;/sup&gt;</th>
<th>8. DHEQ&lt;sup&gt;f&lt;/sup&gt;</th>
<th>9. FOS&lt;sup&gt;g&lt;/sup&gt;</th>
<th>10. OI&lt;sup&gt;h&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.52**&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1</td>
<td>.39**&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.18**&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1</td>
<td>-0.09&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.04&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.11**&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.03&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>0.32**&lt;sup&gt;c&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td>-0.08&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.15**&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>0.46&lt;sup&gt;c&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td></td>
<td>-0.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.10&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.01&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>0.18**&lt;sup&gt;c&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td></td>
<td>-0.08&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.09&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.14&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.06&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>0.15**&lt;sup&gt;c&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td></td>
<td>0.04&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.14&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.21**&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.31**&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>0.16**&lt;sup&gt;c&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td>-0.02&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.31**&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.17**&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

Mean (SD) N/A N/A N/A N/A N/A 4.64 2.62 59.69 120.95 4.41

Mean (SD) (4.75) (5.46) (28.44) (32.90) (1.57)

Notes: *p < .05, **p < .01, aSpearman r, bPearson r, cCramer’s V
<sup>d</sup>Drug Use Disorders Identification Test, possible range 0-40
<sup>e</sup>Alcohol Use Disorders Identification Test, possible range 0-44
<sup>f</sup>Daily Heterosexist Experiences Questionnaire, possible range 0-250, average number of items endorsed 17.6 out of 50
<sup>g</sup>Family of Origin Scale, possible range 40-200
<sup>h</sup>Outness Inventory, possible range 1-7
Table 3

Correlations/Associations, Means and Standard Deviations of Predictors and Outcomes, Sample 2

<table>
<thead>
<tr>
<th></th>
<th>1. Age (1=18-24, 2= 25-34, 3=35-44, 4=45-54)</th>
<th>2. Education Level</th>
<th>3. Gender</th>
<th>4. Geographic Location</th>
<th>5. Race/Ethnicity</th>
<th>6. AUDIT ( ^d )</th>
<th>7. DUDIT ( ^e )</th>
<th>8. DHEQ ( ^f )</th>
<th>9. FOS ( ^g )</th>
<th>10. OI ( ^h )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>1</td>
<td>.28** (^c)</td>
<td>.23* (^c)</td>
<td>.21* (^c)</td>
<td>.21* (^c)</td>
<td>-.02 (^a)</td>
<td>-.06 (^a)</td>
<td>-.16* (^a)</td>
<td>.01 (^a)</td>
<td>.04 (^a)</td>
</tr>
<tr>
<td>2. Education Level</td>
<td>1</td>
<td>1</td>
<td>.28** (^c)</td>
<td>.21* (^c)</td>
<td>.21* (^c)</td>
<td>-.09 (^a)</td>
<td>-.12 (^a)</td>
<td>-.09 (^a)</td>
<td>.11 (^a)</td>
<td>.09 (^a)</td>
</tr>
<tr>
<td>3. Gender</td>
<td>.23* (^c)</td>
<td>1</td>
<td>.21* (^c)</td>
<td>.10* (^c)</td>
<td>1</td>
<td>-.09 (^a)</td>
<td>.10* (^c)</td>
<td>.17* (^c)</td>
<td>-.11 (^a)</td>
<td>.10 (^a)</td>
</tr>
<tr>
<td>4. Geographic Location</td>
<td>.21* (^c)</td>
<td>.21* (^c)</td>
<td>1</td>
<td>-.02 (^a)</td>
<td>-.09 (^a)</td>
<td>-.12 (^a)</td>
<td>.10* (^c)</td>
<td>.17* (^c)</td>
<td>-.11 (^a)</td>
<td>-.15 (^b)</td>
</tr>
<tr>
<td>5. Race/Ethnicity</td>
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<td>.17* (^c)</td>
<td>.17* (^c)</td>
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<td>-.02 (^a)</td>
<td>-.09 (^a)</td>
<td>-.12 (^a)</td>
<td>.10* (^c)</td>
<td>.17* (^c)</td>
<td>-.11 (^a)</td>
</tr>
<tr>
<td>6. AUDIT ( ^d )</td>
<td>-.02 (^a)</td>
<td>-.09 (^a)</td>
<td>-.09 (^a)</td>
<td>1</td>
<td>-.02 (^a)</td>
<td>-.09 (^a)</td>
<td>-.09 (^a)</td>
<td>1</td>
<td>-.02 (^a)</td>
<td>-.09 (^a)</td>
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<tr>
<td>7. DUDIT ( ^e )</td>
<td>-.06 (^a)</td>
<td>-.12 (^a)</td>
<td>.10* (^c)</td>
<td>.21* (^c)</td>
<td>.39** (^a)</td>
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<td>-.06 (^a)</td>
<td>-.12 (^a)</td>
<td>.10* (^c)</td>
<td>.21* (^c)</td>
</tr>
<tr>
<td>8. DHEQ ( ^f )</td>
<td>-.16* (^a)</td>
<td>-.19* (^a)</td>
<td>.03 (^a)</td>
<td>.15 (^a)</td>
<td>.25** (^b)</td>
<td>.33** (^a)</td>
<td>1</td>
<td>-.16* (^a)</td>
<td>-.19* (^a)</td>
<td>.03 (^a)</td>
</tr>
<tr>
<td>9. FOS ( ^g )</td>
<td>.01 (^a)</td>
<td>.11 (^a)</td>
<td>-.07 (^a)</td>
<td>.06 (^a)</td>
<td>-.11 (^a)</td>
<td>-.15 (^b)</td>
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<td>-.26** (^b)</td>
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<td>-.24** (^a)</td>
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<tr>
<td>10. OI ( ^h )</td>
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<td>-.07 (^a)</td>
<td>.09 (^a)</td>
<td>.06 (^a)</td>
<td>-.11 (^a)</td>
<td>-.15 (^b)</td>
<td>-.24** (^a)</td>
<td>-.26** (^b)</td>
<td>.30** (^b)</td>
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</tr>
</tbody>
</table>

Mean (SD) | N/A | N/A | N/A | N/A | N/A | 6.97 (8.05) | 7.61 (9.84) | 58.80 (35.47) | 111.65 (35.47) | 4.00 (1.71) |

Range | N/A | N/A | N/A | N/A | N/A | 0-33 | 0-41 | 0-180 | 41-194 | 1-7 |

Notes: *\( p < .05 \), **\( p < .01 \), \(^{a}\)Spearman \( r_{s} \), \(^{b}\)Pearson \( r \), \(^{c}\)Cramer’s \( V \)
\(^{d}\)Alcohol Use Disorders Identification Test, possible range 0-40
\(^{e}\)Drug Use Disorders Identification Test, possible range 0-44
\(^{f}\)Daily Heterosexist Experiences Questionnaire, possible range 0-250,
average number of items endorsed 18.7 out of 50
\(^{g}\)Family of Origin Scale, possible range 40-200
\(^{h}\)Outness Inventory, possible range 1-7
Table 4
Hierarchical multiple regression predicting reported alcohol use from age, minority stress, family attachment, and outness, Sample 1

<table>
<thead>
<tr>
<th>Total AUDIT scores</th>
<th>β</th>
<th>p</th>
<th>R²</th>
<th>ΔR²</th>
<th>r</th>
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<tbody>
<tr>
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<td>.027**</td>
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<td>Step 2</td>
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<td>Family Attachment</td>
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<td>Outness</td>
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<td>.08</td>
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<td>Step 3</td>
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<td>Family Attachment</td>
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<td>Outness</td>
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<td>Minority Stress x Family Attachment</td>
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<td>Minority Stress x Outness</td>
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<td>-.03</td>
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<tr>
<td>Outness</td>
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<td>.512</td>
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<tr>
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<tr>
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<td>.646</td>
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</table>

Notes. N= 339 *p < .05, **p < .01, Minority Stress = Total Daily Heterosexist Experiences Questionnaire score, Family Attachment = Total Family of Origin Scale score, Outness = Average Outness Inventory score, Effect sizes calculated using Wilson (2001).
Table 5
Hierarchical multiple regression predicting reported alcohol use from age, minority stress, family attachment, and outness, Sample 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Total AUDIT scores</th>
<th>β</th>
<th>p</th>
<th>R²</th>
<th>ΔR²</th>
<th>r</th>
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<tr>
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<td>Outness</td>
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<td>.05</td>
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<td>Minority Stress x Family Attachment</td>
<td>.031</td>
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<tr>
<td>Minority Stress x Outness</td>
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<td>.952</td>
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<tr>
<td>Family Attachment x Outness</td>
<td>-.112</td>
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<td>.09</td>
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<tr>
<td>Minority Stress x Family Attachment x Outness</td>
<td>-.091</td>
<td>.324</td>
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</tbody>
</table>

Notes. N= 178 *p < .05, **p < .01, Minority Stress = Total Daily Heterosexist Experiences Questionnaire score, Family Attachment = Total Family of Origin Scale score, Outness = Average Outness Inventory score, Effect sizes calculated using Wilson (2001).
Table 6
Multinomial logistic regression testing minority stress, family attachment, and outness as determinants of reported drug use category, Sample 1

<table>
<thead>
<tr>
<th>Characteristic</th>
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<tbody>
<tr>
<td></td>
<td>Odds</td>
<td>95% C.I. for</td>
<td>Odds Ratio</td>
<td>p</td>
<td>r</td>
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<tr>
<td>No Drug Use vs. Non-Problem Drug Use</td>
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<td></td>
</tr>
<tr>
<td>Minority Stress</td>
<td>1.217*</td>
<td>1.044-1.420</td>
<td>1.044</td>
<td>.012</td>
<td>.05</td>
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<tr>
<td>Family Attachment</td>
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<td>0.991-1.008</td>
<td>0.991</td>
<td>.913</td>
<td>.01</td>
</tr>
<tr>
<td>Outness</td>
<td>1.108</td>
<td>0.932-1.316</td>
<td>0.932</td>
<td>.246</td>
<td>.03</td>
</tr>
<tr>
<td>No Drug Use vs. Problem Drug Use</td>
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<td></td>
</tr>
<tr>
<td>Minority Stress</td>
<td>1.358**</td>
<td>1.099-1.678</td>
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<tr>
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<td>0.980-1.003</td>
<td>0.980</td>
<td>.136</td>
<td>.01</td>
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<tr>
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<td>1.001-1.683</td>
<td>1.001</td>
<td>.049</td>
<td>.07</td>
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</table>

Notes. N= 331 * p < .05, ** p < .01, Reference Category = No Drug Use (DUDIT score 0), Non-Problem Drug Use = DUDIT scores 1-7, Problem Drug Use = DUDIT scores > 7 Effect sizes calculated using DeCoster (2012).
Table 7
Multinomial logistic regression testing minority stress, family attachment, and outness as determinants of reported drug use category, Sample 2

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No Drug Use vs. Non-Problem Drug Use</th>
<th>No Drug Use vs. Problem Drug Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratio 95% C.I. for Odds Ratio</td>
<td>Odds Ratio 95% C.I. for Odds Ratio</td>
</tr>
<tr>
<td>Minority Stress</td>
<td>1.002 0.989-1.015 .738 .01</td>
<td>1.016* 1.004-1.029 .010 .01</td>
</tr>
<tr>
<td>Family Attachment</td>
<td>0.991 0.979-1.003 .131 .01</td>
<td>0.983** 0.971-0.995 .006 .01</td>
</tr>
<tr>
<td>Outness</td>
<td>1.156 0.908-1.472 .239 .04</td>
<td>1.349* 1.053-1.728 .018 .08</td>
</tr>
</tbody>
</table>

Notes. N= 171 *p < .05, ** p < .01. Reference Category = No Drug Use (DUDIT score 0), Non-Problem Drug Use = DUDIT scores 1-7, Problem Drug Use = DUDIT scores > 7
Effect sizes calculated using DeCoste (2012).