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BINEGATIVE MINORITY STRESS, PSYCHOLOGICAL PROCESSES, AND DISORDERED  
ALCOHOL USE: DISPARAITIES AMONG SEXUAL MINOTIRY WOMXN

By

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Thesis

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Binegative Minority Stress, Psychological Processes, and Disordered Alcohol Use: Disparities Among Sexual Minority Womxn

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Sexual minority womxn (i.e., woman-identified persons) tend to report more harmful alcohol use and more negative alcohol use outcomes than heterosexual women—a pattern not consistently observed in man-identified populations. Further, bisexually-oriented, hereafter called nonexclusively-oriented, womxn (NOW) report more negative alcohol use outcomes and meet criteria for alcohol use disorder at higher rates than both lesbians and heterosexual women (or exclusively-oriented womxn; EOW). These disparities require further investigation to explicate the antecedents and mechanisms impacting alcohol use for this at-risk population. This project examines the incremental negative effects of binegativity as a specific minority stressor and antecedent of disordered alcohol use. Given that non-exclusive orientation uniquely straddles sexual minority and heterosexual spheres, examining stressors and psychological processes that are distinctly experienced by NOW are vital steps toward informing targeted alcohol use treatment for this population.

NOW and EOW (N = 432) responded to questions on an online survey regarding general minority stress, binegative minority stress, psychological processes (i.e., positive alcohol expectancies, alcohol use motivations, queer social support) and alcohol use. NOW report higher cumulative minority stress loads than EOW, although EOW reported more heterosexist experiences than NOW. Among NOW, binegative minority stressors accounted for unique variance in alcohol use disorder symptoms, over and above general minority stressors. General minority stressors accounted for variance in alcohol use disorder symptoms among NOW, too. NOW and EOW did not differ in reported positive alcohol expectancies or queer social support; however, NOW reported drinking alcohol to cope more than EOW. Parallel mediation analyses identified that drinking to cope and queer social support partially mediated the relationship between proximal, but not distal, binegative minority stress. Expectations of rejection, a key general minority stressor, was positively related to alcohol use disorder symptoms among NOW, but not related to psychological processes.

General and binegative minority stressors are important factors related to alcohol use disorder symptoms among NOW. Additionally, psychological processes, particularly drinking alcohol to cope, and queer social support, may be important factors for health care providers to consider in the prevention of and invention on disordered alcohol use symptoms for this vulnerable group.

Binegative Minority Stress, Psychological Processes, and Disordered Alcohol Use: Disparities  
among Sexual Minority Womxn

Examining health disparities among sexual minority individuals reveals a complicated tapestry of interwoven stressors and psychological processes as they intersect with dimensions of sexual orientation. Established patterns of alcohol use and alcohol use disorder in the general population do not adequately explain unique factors affecting sexual minority populations, and sexual minority individuals often report alcohol use that is quite different than that of the general population. Disparate alcohol use might be best explained by the relationship between unique minority stressors and psychological processes, considering that experiences vary across groups within sexual minority populations. Measurement of sexual orientation, gender, and alcohol use are still evolving, which complicates conducting research in these areas. Both in spite of and because of these concerns, it is imperative to explore the mechanisms that connect sexual minority status to increased alcohol use, particularly in light of recent sociopolitical and ontological changes in the conceptualizations of sexuality, gender, and alcohol use.

**Operational Definitions: Sexuality and Gender**

Substantial evidence supports the conclusion that sexual minority individuals disproportionately use alcohol compared to heterosexuals (Talley et al., 2016). However, descriptive and analytic research related to alcohol use and misuse warrants closer examination of the methods and analytic approaches used. The operational definitions of sexual orientation, sexual identity, and sexual minority status for this paper are described below. While sexual minority researchers generally agree on the descriptions of these constructs, ideas are still

evolving. Sexual orientation broadly refers to patterns of sexual and emotional attraction, behavior, desire and identity. Sexual identity refers to identifying as a particular sexual orientation (e.g., lesbian, gay, bisexual). Though related, these constructs do not always align. Sexual identity does not necessarily reflect all of the complex facets of sexual orientation; thus, individuals with a shared sexual identity may report diverse patterns of attraction, behavior, and desire. For example, some individuals may claim a heterosexual sexual identity, but report attractions, behaviors, and desires that indicate their sexual orientation is not exclusively heterosexual (e.g., Men who have Sex with Men [MSM] or Women who have Sex with Women [WSW]). Further, two individuals who share a sexual identity (e.g., bisexual) may vary substantially in their attraction, behavior, desire, and conceptualization of what their sexual identity signifies. Sexual minority status generally indicates individuals whose sexual orientation is not heterosexual (i.e., exclusively *self-identified* as heterosexual, exclusively *emotionally and sexually attracted* to people of another gender, exclusively engaging [past or present] in *sexual or romantic behavior* with persons of another gender, or reporting exclusive *desires* concerning persons of another gender). The broad dimensions that comprise sexual orientation create significant challenges in assessing sexual minority status.

### **Exclusive vs. Non-exclusive Sexual Orientations**

The shifting operational definitions and measures of sexual orientation over time complicate any discussion of past and current literature. Therefore, essential sexual minority statuses and common groupings of sexual minority statuses are outlined here to provide clarity. Lesbians, or gay women, are often grouped with gay men, designated LG. Lesbians, gay men, and bisexual-identified individuals comprise another common grouping (LGB; typically, no gender distinctions are delineated between bisexual individuals). Further, gay men and bisexual

men are commonly grouped (GB) as well as lesbians and bisexual women (LB). However, sexual minority refers to all individuals with non-heterosexual orientations, including those identities outlined above (SM). Some sexual minority and gender minority individuals might also identify as queer, a reclaimed, affirmative term that is used in the current review as an overarching term to refer to all individuals with non-heterosexual orientations or whose gender identity is non-cisgender. Historically, individuals oriented towards more than one gender are referred to as bisexual; however, such non-exclusive orientations are heterogeneous in the dimensions of sexual orientation, especially with regard to sexual identity. As sexual identities are socially constructed (Foucault, 1978; Barker, 1999), sexual identities reflect diverse conceptualizations of what patterns of attraction, behavior, and desire constitute a particular identity for a particular individual. Therefore, nonexclusively-oriented individuals may claim a range of sexual identities, but may share similar experiences concerning attraction, behavior, and desire.

### **Gender and Womxn**

As with sexuality, our understanding of gender continues evolve. Importantly, gender and assigned sex are distinct constructs that sometimes, but do not always align. Sex, also called assigned sex, or sex assigned at birth refers to the sex category (i.e., male, female) a person is given at birth. This assignment is typically based on their external genitals; however, sex might broadly refer to other biological factors, including chromosomes, hormones, and body parts (e.g., vulvas, penises, clitorises, testicles, etc.). Although often thought as a binary, biological characteristics associated with male and female sex categories do not always uniformly align (i.e., intersex; e.g., people born with vulvas and testes, people born with multiple X chromosomes). Additionally, gender-affirming medical procedures (e.g., hormone replacement

therapy, genital reconstruction surgeries) challenge the notion of sex as binary, permanent, and final. Categories describing sex assigned at birth continues to expand beyond a faulty binary, as do the categories used to describe someone's gender. In contrast to assigned sex, gender refers to a person's felt-sense of their gender identity and gender expression. Gender identity refers to self-determined gender categories, which sometimes align with assigned sex (i.e., cisgender; Schilt & Westbrook, 2009; e.g., a person assigned female at birth identifies as a woman) and sometimes do not. Transgender broadly refers to individuals whose assigned sex does not align with their gender identity, and is also a gender identity. Some individuals whose gender does not align with their assigned sex may identify themselves as transgender, describe their gender identity in other ways (i.e., non-binary, trans masculine, trans feminine, demigirl, demiboy, genderqueer, genderfluid,) or identify as transgender and another gender identity or identities (American Psychological Association [APA], 2015). Gender identity does not necessarily reflect the unique ways people of the same gender identity express their gender in terms of masculinity, femininity, androgyny, or other gendered communicative ways. Gender expression encapsulates the many ways people communicate their gender to others (i.e., through clothing, grooming, and comportment; APA, 2015; Butler, 1990).

Sex and gender are often conflated in empirical study, from measurement, analyses, and reporting. Using sex and gender interchangeably complicates ascertaining the assigned sex and gender of participants represented. This is further complicated when stratifications are made on poorly operationalized sex or gender variables (i.e., male/female comparisons). Poor assessment and treatment of sex and gender variables may lead even well-intentioned researchers to misgender their participants, and misrepresent their experiences and data. As such, clear,

purposeful and considerate measurement, analyses, and reporting of gender remains imperative to the conducting ethnical research, and the ethical treatment of participants.

This necessity is complicated as assessment of sexuality, sex, and gender continues to evolve alongside the language used to describe groups: what is considered affirming language and practice at present is likely to change over time, cultures and contexts. To affirm participants' gender identities, represent their experiences accurately, and reflect our current understanding and affirmation of gender, the term womxn (pronounced both as 'wo-minx' and 'wo-man') is used to describe individuals who identified themselves as women, trans women, transfeminine, or demi-girls, regardless of their assigned sex. Womxn was coined by intersectional feminists to better reflect the diverse experiences of discrimination on the basis of marginalized statuses, including racism, classism, sexism, transphobia, homophobia, xenophobia, ableism (and other forms of discrimination and prejudice), as well to distance the word "woman" from "man". The term womxn will be used to describe the participants in the current study and when explicating terminology, as measurement of gender and sex in previous research precludes making determinations of the gender or sex of a sample.

It is important to designate both gender identity and sexual orientation, as this intersection differentially relates to alcohol use disparities. Therefore, in the current review nonexclusively-oriented womxn and nonexclusively-oriented men (i.e., man-identified) are abbreviated as NOW and NOM, respectively. Untangling these facets of sexual orientation becomes increasingly challenging, especially if sexual identity is the only dimension of sexual orientation assessed (and if that measure provides limited identification options).

Measurement of these complex constructs continues to evolve. Therefore, past and current literature reflects the iterative and uneven process of precisely capturing alcohol use,



gender, and sexual orientation. Some work may carefully measure alcohol use, but use limited measures of sexual orientation and gender; some studies may carefully measure sexual orientation and gender, but haphazardly assess alcohol use. Therefore, integrating the more mature literature of alcohol use with the burgeoning fields of sexual and gender minority health requires embracing the dialectic of progress in some areas while accepting flaws in other areas.

### **Alcohol Use Disparities in Sexual Minority Individuals**

#### **Heterosexual Comparisons to Sexual Minority Individuals**

Early studies of prevalence rates of alcohol use among LG individuals showed significantly higher rates of disordered alcohol use (e.g., alcohol dependency) compared to heterosexual individuals (Fifield, Latham, & Phillips, 1977; Lohrenz, Connely, Coye, & Spare, 1978; Saghir & Robins, 1973). Problems across these early studies most likely resulted in overestimating alcohol use in these populations. Methodological flaws, such as oversampling from bars and from groups of gay men and lesbians seeking substance use treatment, contributed to these initial extreme rates (for a review, see Israelstam & Lambert, 1986). Accounting for this limitation, a second wave of research on alcohol use in lesbians and gay men resulted in reports of less extreme alcohol use differences between sexual minority individuals and heterosexuals (Bloomfield, 1993; Bradford, Ryan, & Rothblum, 1994; Hughes, Haas, Razzano, Cassidy, & Matthews, 2000; McKirman & Peterson, 1989; Martin et al., 1989; Skinner & Otis, 1992; Stall & Wiley, 1988). Despite methodological issues, these early explorations were essential, as they shed light on alcohol use disparities in sexual minority populations, which is now recognized as a public health problem (Institute of Medicine, 2011).

#### **Binary Gender-Stratification**

Binary gender differences in alcohol use patterns have been assessed by comparing sexual minority women to heterosexual women, and sexual minority men to heterosexual men. Early research (e.g., McKirnan & Peterson, 1989; Fifield, Latham & Phillips, 1977) that stratified alcohol use by gender and sexual orientation uncovered alcohol use patterns among sexual minority individuals opposite to use rates among heterosexual populations: sexual minority *women* reported significantly higher alcohol use rates. Sexual minority women were less likely to abstain from using alcohol, indicated more frequent alcohol use, and reported higher alcohol consumption compared to heterosexual women (Burgard, Cochran, & Mays, 2005; Dimant, Wold, Spitzer, & Gerberg, 2000). However, this pattern is not consistent across sexual minority men, who reported similar alcohol use patterns to heterosexual men (Cochran, Keenan, Schober, & Mays, 2000; Cochran & Mays, 2000; King et al., 2003; McCabe, Boyd, Hughes, & d'Arcy, 2003). Beyond alcohol use patterns, sexual minority women are more likely to experience negative alcohol use consequences (Drabble, Midanik, & Trocki, 2005) and to meet criteria for disordered alcohol use (i.e., alcohol dependency) compared to heterosexual women (Sandfort, de Graaf, Bijl & Schnabel, 2001). Although highlighting that sexual minority women are at an increased risk for alcohol use, these studies did not *explicitly* include sexual minority individuals other than gay men and lesbians. Due to the aforementioned measurement issues, individuals with non-exclusive sexual orientations were combined with exclusively-oriented sexual minority individuals. This highlights the need for examination of discrepancies between sexual minority womxn with various sexual orientations. As gender assessment adhered to binary gender categories, further explication of the unique experiences of womxn is also necessary.

### **Exclusively and Nonexclusively Oriented Sexual Minority Individuals**

Another pressing methodological issue of sexual minority alcohol use is that typically, only gay men and lesbians are explicitly examined. This reflects two potential missteps: limiting sexual identity response options (i.e., providing only “gay/lesbian” and “heterosexual”), or intentionally lumping those who indicated anything other than “heterosexual” as their sexual orientation into the gay men or lesbian groups. Both erase nonexclusively-oriented individuals. Limiting response options forces individuals with other sexual orientations to then select an option that is not reflective of their true experiences. For example, a bisexually-identified person may select to identify as heterosexual, if identifying their sexual orientation as bisexual is not possible. Therefore, the resulting sexual orientation groups are not accurate reflections of gay, lesbian, or heterosexual sexual orientations, but rather an unknown mixture of individuals across all groups that are likely to include some sexual minorities. Another similar methodological issue is combining exclusively-oriented (i.e., lesbians, gay men) individuals and non-exclusively oriented (e.g., bisexual, pansexual) individuals into a single group for inferential analyses. This practice is reflective of the challenges of accessing a hidden population and struggling to meet desired sample sizes. However, combining disparate sexual orientation groups may hide important disparities in alcohol use between these groups. Therefore, conclusions concerning alcohol use from these studies may represent an inaccurate reflection of alcohol use only in gay men or lesbians.

### **Alcohol Use in Exclusively-Oriented and Nonexclusively-Oriented Sexual Minority Women**

Attempts to address issues in measuring sexual orientation have relied on innovative approaches, such as using past sexual behavior to create groups that reflect both exclusively-oriented and nonexclusively-oriented sexual minority women. Although defining sexual orientation behaviorally provides a way to examine sexual minorities in large, nationally

representative databases, this method fails to capture other facets of sexual orientation such as attraction, desire and identity. Regardless, rough measures of sexual orientation allow researchers to examine and establish alcohol use disparities among sexual minority populations.

Eisenberg and Weschler (2003) found women who indicated a history of sexual behavior with “both sexes” (i.e., behaviorally defined as bisexual) were more likely to binge drink than women who reported sexual histories only with the “opposite sex” (i.e., behaviorally defined as heterosexual). However, no differences in binge-drinking behaviors emerged between behaviorally-defined lesbians and heterosexual women. In examining binge-drinking behaviors among men, very different results emerged. Behaviorally-defined gay men and heterosexual men did not differ in their likelihood of binge drinking. However, behaviorally-defined bisexual men were significantly *less* likely to binge drink than heterosexual men (Eisenberg & Weschler, 2003). These findings are similar to results reported by Cochran and Mays (2000) concerning alcohol use outcomes among behaviorally-defined sexual minority women. Compared to behaviorally-defined heterosexual women, behaviorally-defined sexual minority women indicated both more frequent drinking, and higher alcohol consumption. Importantly, behaviorally-defined sexual minority women were also more likely to meet criteria for alcohol dependency syndrome, compared to behaviorally-defined heterosexual women (Cochran et al., 2000).

Further, Cochran and Mays (2000) examined binary gender differences among participants reporting exclusively same-gender partners and those reporting both-male-and-female partners. Among those four sexual minority groups, no group was more likely to meet criteria for alcohol dependency. However, this null finding may reflect insufficient power to detect differences, as fewer than 60 participants indicated any same-gender sexual activity,

meaning each group contained about 15 participants. Nonetheless, some research utilizing behaviorally-defined sexual orientation suggests women with both same and other gender partners report significantly more alcohol use than women with only same-gender partners.

In an sample of women, Burgard et al. (2005) examined differences in sexual histories in relation to alcohol use outcomes. In a blunt, behavioral measure of sexual orientation, women were grouped into “homosexually-experienced” (i.e., reporting any history of same-sex behavior) and “exclusively heterosexually-experienced” (i.e., reporting an exclusively male sexual history) categories. Comparisons between these groups of women indicated “homosexually-experienced women” were more likely to consume alcohol weekly, and on more days per month. However, dividing and comparing groups of women by their recent sexual history demonstrated a more complicated picture. Women behaviorally defined as bisexual (i.e., in the past 12 months had both male and female partners) consumed more alcohol on days they drank and were more likely to binge drink than heterosexual women. Behaviorally-defined lesbians (i.e., women with recent sexual contact exclusively with women) were less likely to binge drink than behaviorally-defined heterosexual women (i.e., women with recent sexual contact exclusively with men). The complex results resented above highlight how blunt, behavioral measures of sexual orientation might obfuscate diverse experiences. Collapsing exclusively-oriented and nonexclusively-oriented women into a single, omnibus sexual minority group may conceal distinct differences in alcohol use. As shown by Burgard et al., (2005) comparing heterosexual women to all other sexual minority women obscured both higher alcohol consumption and binge-drinking tendencies unique to behaviorally-defined bisexual women.

Dimant and colleagues (2000), utilizing self-identified sexual orientation rather than behavioral definitions, reported both bisexual women and lesbians were more likely to report

past month alcohol use, heavy alcohol consumption (i.e., 3 or more drinks in a sitting), and frequent heavy alcohol consumption (i.e., drinking more than 3 drinks almost daily in the past month) when compared to heterosexual women. More recently, Conron, Mimiaga, and Landers (2010) found self-identified bisexual women binge drank at higher rates compared to heterosexual women. These results concerning binge drinking among bisexually-identified women have been replicated (Dermody et al., 2014; Schauer, Berg, & Bryant, 2013). As binge drinking is a strong predictor of AUD development, these results indicate nonexclusively-oriented women may be at an increased risk for developing an AUD. In fact, King et al. (2008) estimate sexual minority women (i.e., self-identified lesbians and bisexual women) are 4 times more likely to develop an AUD than heterosexual women.

### **Sexual Minority Women and Heterosexual Comparison Groups**

The early studies presented above compared sexual minority women to heterosexual women, rather than to other groups of sexual minority women (i.e., comparing exclusively-oriented individuals and nonexclusively-oriented individuals). Collapsing these disparate patterns of attraction, behavior, and identity into a single group may mask important use differences between elusively oriented and non-exclusively oriented women. Some researchers have attempted to correct this misstep.

Utilizing a self-identified sample of sexual minority women, Wilsnack et al. (2008) compared bisexual women's hazardous drinking behaviors (e.g., 12 month prevalence of heavy episodic drinking, alcohol dependence symptoms) to that of both heterosexual women and lesbians. Although both groups of sexual minority women, lesbians and bisexual women, reported higher rates of hazardous drinking compared to heterosexual women, bisexual women reported significantly more frequent hazardous drinking compared to lesbians (Wilsnack et al.,

2008). Importantly this study utilized small samples, highlighting potentially large effects differences in harmful alcohol use between groups of sexual minority women.

As aforementioned, few studies differentiate between sexual minority groups, often including lesbians, bisexual women and other non-heterosexual identities in a single group (e.g., Brewster & Tillman, 2012; Dermody et al., 2014; Goldberg, Strutz, Herrying & Halpern, 2013). The limited research in this area suggests that nonexclusively-oriented womxn are at a higher risk for alcohol misuse than exclusively-oriented sexual minority womxn. Kerr, Ding, and Chaya (2014) found bisexual women were more likely than lesbians to meet criteria for an AUD (based on the Alcohol Use Disorders Identification Test). Though this study did not include other nonexclusive sexual identities (e.g., pansexual, sexually fluid), findings from Kerridge et al. (2016) supplemented this disparity. In this study, significantly more “bisexual/unsure” women met criteria for an AUD, using DSM-5 diagnostic criteria (APA, 2013). Though unsure-identified women and bisexual-identified women were collapsed into a single group, this supports the importance of carefully examining disordered alcohol use along dimensions of sexual orientation. Exclusively-oriented womxn and nonexclusively-oriented womxn likely differ in lived experiences that relate to different alcohol use patterns, especially disordered alcohol use.

## **Theory**

### **Minority Stress and Binegativity**

Historically, psychologists have stigmatized and pathologized sexual minority individuals. It is therefore critical to conduct research that ameliorates the pathologized perception of sexual minority individuals. Minority stress theory (Meyer, 2003) importantly separates sexual minority status from psychopathology by proposing that sexual minority

identity does not equate to mental health problems, but rather that additional societal-produced stress precipitates mental health disparities. Meyer (2003) states minority stress includes two difference kinds of stressors: proximal and distal stressors. Proximal stressors depend on individual appraisals. Proximal stressors are associated with self-identification with a minority status, and are subjective depending on the social and personal meaning of an identity. For example, personal identification with a minority status may precipitate expectations of rejection in interacting with others, concealment of one's identity, or internalization of stigma. Distal stressors are objective and independent from identification with minority status, and stem from social perceptions, such as discrimination, stigma and prejudice (Meyer, 2003). Further, Meyer (2003) describes that potential strengths accompany the above vulnerabilities, such as contextual factors including privileged socioeconomic status and access to social support. Some sexual minorities, namely bisexual individuals, may experience more daily stressors than gay men and lesbians (Meyer, 2003; Jorm, Korten, Rodgers, Jacomb, & Christensen, 2002) and differ in the strengths associated with their minority status.

Individuals with non-exclusive sexual orientations often face "dual discrimination" from both heterosexual and sexual minority communities (Balsam & Mohr, 2007; Koh & Ross, 2006; Kuyper & Fokkema, 2011; Yost & Thomas, 2012) - a specific minority stressor referred to as binegativity. A large body of literature suggests that bisexual individuals experience unique discrimination and prejudice from both heterosexuals and lesbian and gay men (Rust, 1995; Balsam & Mohr, 2007; Brewster & Moradi, 2010; Hequembourg & Brallier, 2009; Mohr & Rochlen, 1999; Elison, 1997). Binegativity includes: perceptions of bisexuality as an unstable and invalid sexual orientation (e.g., bisexual individuals are just confused, experimenting, or in denial about their sexual identity); perceptions that bisexual individuals are sexually



promiscuous, diseased or unable to have monogamous relationships; and general hostility or social rejection of bisexually identified individuals (Dyar, Feinstein, & London, 2014; Yost & Thomas, 2012; Herek, 2000; Brewster & Moradi, 2010; Morh & Rochlen, 1999). Bisexual identities are not only devalued, but also erased, as many still view sexuality in binary rather than continuous terms (Ochs, 1996; Elison, 2000). Bisexual individuals are often assumed to have the same experiences of gay men and lesbians, or that the gender of their current partner determines their sexual orientation (e.g., if partnered with someone of the same-gender, they are perceived as gay; if partnered with someone of another gender, they are perceived as heterosexual; Balsam & Mohr, 2007). This invisibility is perpetuated through ignoring bisexuality as a valid sexual identity (Elison, 2001; Mohr & Fassinger, 2004) and depicting bisexuality as temporary or transitory (Alarie & Gaudet, 2013).

Extending minority stress theory, bisexual individuals are more likely to conceal their sexual identity than lesbians and gay men, and are less likely to disclose their sexual orientation (Balsam & Mohr, 2007; Kuypers & Fokkema, 2011; Morris et al., 2001), simultaneously increasing minority stress associated with concealment and depriving bisexual individuals of social support from both heterosexual and sexual minority communities (Sheets & Mohr, 2009; Syzmanski, 2009; Hequembourg & Brallier, 2009). Access to support and experiences of discrimination also may fluctuate with the perceived gender of one's partner, or whether one can "pass" in a given context (Ochs, 1996; Ross et al., 2010; Dyar, Feinstein & London, 2014). Further, bisexual individuals experience more negative thoughts and feelings concerning their sexual orientation (Cox, vanden Berghe, Dewaele, & Vincke, 2010; Rosario et al., 2002), suggesting they internalize negative social attitudes more than lesbians and gay men.

Bisexual individuals may encounter unique distal stressors relating to their identity. These stressors include sexual identity uncertainty, or the extent to which an individual is uncertain which sexual identity label is more accurate or appropriate for them, and sexual identity centrality, or the extent to which one's sexual identity is important to one's sense of self (Feinstein & Dyar, 2017). Bisexual individuals also experience unique proximal stressors related to binegative beliefs, such as identity erasure depending on the perceived gender of partner or partners (e.g., assumed lesbian identity or heterosexual identity; Feinstein & Dyar, 2017). Understanding the nature of these unique stressors may highlight mechanisms that underlie alcohol use disparities among bisexual identified individuals.

The Minority Stress Model (Meyer, 2003), and its extension, the Psychological Mediation Framework (Hatzenbuehler, 2009), provide mechanistic theories that integrate minority stress (e.g., experiencing discrimination, heterosexism) and psychological processes (e.g., alcohol expectancies, social support, emotion regulation) to explain mental health disparities without extending a pathologizing lens. Often, sexual minority research focuses on minority stress as a predictor of harmful alcohol use, rather than examining processing pathways that ultimately result in disordered alcohol use. Examination of these processes may reveal important protective factors or points where treatment may be deployed. Although Hatzenbuehler (2009) states that the psychological processes outlined are not unique to minority groups but are common processes, some evidence suggests that sexual minority individuals may engage in unique psychological processes. Certainly, minority stress posits an immensely important, and destigmatizing, antecedent for the development of psychopathology. However, examining other relevant sexual minority processes alongside minority stress may best uncover antecedents and mechanisms for disordered alcohol use; however, very little alcohol use research

integrates both minority stress and psychological processes into explanations of increased alcohol use in sexual minority populations. It is also imperative to note that both women and bisexual individuals are underrepresented in sexual minority research, and some careful extrapolation of findings from other minority groups may be necessary.

### **Binegative Minority Stressors and Alcohol Use**

In a study exclusive to bisexual women, Molina et al. (2015) explored minority stressors specific to bisexual individuals: experienced binegativity and internalized binegativity. This unique dual discrimination, both proximal and distal, may explain alcohol use disparities between sexual minority groups, particularly exclusively-oriented and nonexclusively-oriented sexual minority women. Increased experienced bi-negativity was positively associated with both binge drinking and alcohol-related consequences; yet, increased *internalized* bi-negativity was shown to be positively related to alcohol-related consequences only, and not to binge drinking. This distinction between experiencing and internalizing discrimination and its differential relation to binge drinking highlights a potentially relevant mechanism related to disordered alcohol use in this population. Though more work relating bi-negativity to alcohol use is certainly needed, this unique finding connects unique minority stressors to a particular at-risk population. Further research examining minority stressors specific unique to certain sexual minority individuals, such as bi-negativity, may highlight mechanisms for targeted treatment of disordered alcohol use among nonexclusively-oriented women.

Parsing broad minority stressors and binegative stressors may reveal how experiencing distinct stressors might lead to different psychological processing. Encountering identity-salient stressors, such as binegative stressors, may necessitate different forms of psychological processing, such as seeking specific kinds of social support or utilizing different cognitive

appraisals of alcohol use. Nonexclusively-oriented womxn may both encounter binegative stressors more frequently, and utilize psychological processes that inadequately mitigate stress. More binegative stress and poorer psychological processing might both account for alcohol use disparities among nonexclusively-oriented womxn.

### **Psychological Processes and Alcohol Use in Sexual Minority Individuals**

#### **Interpersonal Processes**

Interpersonal factors, such as family context and peer influences, are important psychological processes related to alcohol use among sexual minority groups. As noted in substance use research, the family context presents many risk and protective factors for developing substance use disorders, including heritability (Merikangas & McClair, 2012). Research suggests that the children of parents with substance abuse or dependence are at an increased risk for developing alcohol abuse or dependence (Merkiangas & Avenevoli, 2000). In a non-clinical sample, McCabe, West, Hughes, and Boyd (2013) found evidence to suggest LGB individuals have more extensive family histories of substance abuse problems compared to heterosexuals. This may mean sexual minority individuals may be particularly vulnerable to developing a substance use disorder (McCabe et al., 2013). This finding may suggest sexual minority individuals may have a biological vulnerability to alcohol use, but it is perhaps cofounded with other factors.

The family context extends beyond genetics and includes environmental factors such as social support. Understandably, most research examining family-related factors and alcohol use in sexual minority individuals has focused on youth populations, as this population interacts within the context of family more than adults. Espelage, Aragon, Birkett, and Koeing (2008) found parental support protected against alcohol use for sexual minority youth, though this study

combined marijuana and alcohol use frequencies in its analysis, masking potential differences in use between the substances. Though parental support may protect against substance use, it may be challenging for sexual minorities to access that support: sexual minority youth reported less family support as perceptions of discrimination increased. Interestingly, perceived discrimination was not directly related to alcohol use frequency in the same sample, which may suggest alcohol use frequency may not truly capture disordered alcohol use (Austin & Craig, 2013). Further, mothers reported significantly less affection towards their lesbian and bisexual daughters compared to their heterosexual siblings. This negative relationship was not significant across male children (Rosario et al., 2014). This gender difference suggests social support may not be evenly accessible across sexual minority groups, and may be a relevant minority psychological process to explore in future sexual minority alcohol use research.

In an adult sample of LGB individuals, Levahot and Simoni (2011) found social support may buffer against the relationship between minority stress and increased alcohol abuse. Similar findings of social support acting as a protective factor in the relationship between minority stress (measured via discrimination and violence) and illicit drug use were reported in a sample of men who have sex with men (Traube, Schrage, Holloway, Weiss, & Kipke, 2012). These unique studies are excellent examples of exploring minority stress and general interpersonal psychological processes to explain sexual minority alcohol use disparities. Though these studies highlight mechanisms for increased alcohol use, separate analyses by sexual identity and gender were not drawn. Further examination of these interpersonal factors in specific sexual minority groups (e.g., lesbians compared to bisexual womxn) is necessary.

### **Cognitive Processes: Alcohol Use Perceptions and Motivations**

Another category of minority psychological processes that might relate to increased alcohol use is different social-cognitive perceptions of alcohol use. As described by McKirnan and Peterson (1989), bars have “cultural significance” in sexual minority individuals, a notion supported by Hefferman (1998). Though these social-cognitive processes likely begin before interaction with “bar culture,” alcohol use norms and alcohol use motivations among sexual minority individuals may differ compared to heterosexual individuals (Hatzenbuehler, 2009). Several studies have examined how lesbians conceptualize their alcohol use motivations. Such work has indicated common alcohol use motivations centered on support seeking, such as finding community support, and self-acceptance from social drinking contexts such as bars (Condit, Kitaji, Drabble, & Trocki, 2011; Gruskin et al., 2006; Reyes, 1998; Parks, 1996). However, these studies focused exclusively on lesbians. As explored by Drabble and Trocki (2014), sexual minority women (i.e., lesbians, bisexual women, heterosexual women reporting same-sex partners) reported using alcohol as a motivation for fostering community connection, as well as for mediating stress, more commonly than for self-medication or to lose control. Further, these alcohol use motivations appear to be unique to sexual minority women, as fostering community and mediating stress were not commonly reported among heterosexual women. The potential that sexual minority women have unique alcohol use motivations compared to heterosexual women was supported in a study by Cogger, Conover, and Israel (2012) that reported sexual minority women cited enhanced enjoyment and fun in LGBTQ settings as a salient motivation for alcohol use. Again, this alcohol use motivator was uniquely salient to sexual minority women, and was not reported by heterosexual women.

Across both of the studies above, additional reported coping-related alcohol use motivations (e.g., reduce anxiety, self-medication, stress mediation) were not unique to sexual

minority women. Some evidence suggests that coping-motivated alcohol use may relate to disordered alcohol use among sexual minority women. In a longitudinal study, using alcohol to cope and to conform was positively associated with increased disordered alcohol use in sexual minority women (i.e., lesbians and bisexual women; Talley, Sher, Steinley, Wood, & Littlefield, 2012). Further, Feinstein and Newcomb (2016) found that meeting criteria for an AUD was associated with drinking to cope. However, this study examined drinking to cope among exclusively sexual minority men and may not be easily extrapolated to sexual minority womxn. These studies suggest that both minority psychological processes and general processes relate to disordered alcohol use among sexual minority women. Further, it is unclear which stressors, minority stressors, general stressors, or a combination of both, precede the need for coping.

In a more-detailed investigation of these minority psychological processes, Litt, Lewis, Rhew, Hodge, and Kaysen (2016) found sexual minority women were more likely to perceive other sexual minority women as “drinkers” compared to heterosexual women. These perceptions resulted in a feed-forward fashion of alcohol use, meaning that perceiving other sexual minority women as “drinkers” related to one’s own more frequent alcohol use (Litt et al., 2016). Additionally, Corte, Matthews, Stein, and Lee (2016) theorize that these minority specific perceptions of alcohol use may culminate in the development of a self-schema as a drinker, especially for sexual minority women. However, in the above studies, it is unclear whether increased alcohol use is equated with disordered alcohol use. Further work examining minority cognitive processes and their relation to alcohol use is needed, especially examining potential differences across sexual minority groups.

### **Integrating Interpersonal and Cognitive Psychological Processes**

Little research integrates both interpersonal and cognitive psychological processes in relation to disordered alcohol use among sexual minority women, though one study has investigated this specific relationship. In a sample of lesbians, Lewis, Mason, Winstad, Gaskins and Irons (2016) examined the relations between minority stress (measured as internalized homophobia, concealment, and lack of connection to the lesbian community), interpersonal processes (i.e., social isolation), cognitive processes (i.e., drinking to cope), and hazardous alcohol use. Both social isolation and drinking to cope mediated the relationship between minority stress and hazardous drinking.

### **Current Study**

Integrating facets of minority stress and psychological processes may provide the best understanding of antecedents and mechanisms that maintain alcohol use among sexual minority individuals. However, very little research has examined the unique facets of minority stress (i.e., proximal, distal) as they relate specifically to nonexclusively-oriented womxn (i.e., binegative stressors). Further, the relationship between binegative stressors and psychological processes (i.e., interpersonal and cognitive) is also understudied. Since nonexclusively-oriented womxn are specifically at risk for disordered alcohol use, the focus of this study is to examine binegative stressors and psychological processes in explaining disordered alcohol use in this population.

### **Hypotheses and Proposed Analyses**

The current study will test the hypothesis that nonexclusively-oriented womxn (NOW) experience unique minority stressors compared to exclusively-oriented womxn (EOW), and that these unique stressors correlate with disordered alcohol use indirectly through cognitive and interpersonal psychological processes. Several specific hypotheses will be tested to provide support for this overarching hypothesis.



**Hypothesis 1.** NOW will report higher cumulative minority stress than EOW.

A one-way multivariate analyses of variance (MANOVA) will be conducted to examine the mean differences in minority stress as an integrated construct between NOW and EOW. Minority stress represents a single, unified construct comprised of general and binegative minority stressors. Using a single multivariate analysis as opposed to multiple univariate analyses supports the integration of bi-negativity theory within minority stress theory, which indicates minority stressors of many kinds contribute to a cumulative stress load. As minority stress is comprised of multiple unique, yet overlapping, kinds of social stressors, multiple univariate analyses preclude understanding the cumulative nature of minority stress. Examining multivariate mean differences of a composite minority stress variable best reflects the multifaceted nature of this construct, and allows for a richer understanding of a construct most typically assessed via unidimensional measures. Prior to conducting the analysis, assumptions of the MANOVA analysis will be evaluated (e.g., univariate, bivariate, and multivariate normality, linearity, multicollinearity, equality of variances, and homogeneity of covariance matrices). Based on minority stress and binegativity theory (Meyer, 2003; Ochs, 1996), it is hypothesized that NOW will, on average, report significantly more distal and proximal binegative stressors, and more proximal general minority stressors (i.e., expectations of rejection, concealment, and internalized stigma) than EOW.

**Hypothesis 2.** Among NOW, binegative minority stressors will positively relate to Alcohol Use Disorder symptoms. Further, binegative minority stressors will account for a unique proportion of variance in Alcohol Use Disorder symptoms, over and above demographic covariates, and general minority stress.

To test hypothesis 2, a hierarchical linear regression predicting disordered alcohol use will be conducted, focused only on NOW. Prior to conducting the analysis, multiple regression assumptions will be evaluated (e.g., AUDIT scores are normally distributed across combinations of the independent variables). In step one of the analysis, relevant covariates (age, college student status, relationship status, income, and race/ethnicity) will be entered. General minority stressors will be entered into the second step of the regression. The final step of the analysis will include binegative stressors in order to examine the unique variance accounted for by binegative stressors in disordered alcohol use, over and above general minority stressors. As binegativity theory (Ochs, 1996) proposed NOW experience more binegative stress, it is hypothesized that binegative stressors will account for a unique proportion of variance in disordered alcohol use, over and above covariates and minority stressors.

**Hypothesis 3.** NOW will report more positive alcohol expectancies and endorse using alcohol to cope more than EOW. NOW will report less queer social support than EOW.

A series of independent samples t-tests will be conducted to test the third set of hypotheses. Mean differences between NOW and EOW on the following outcome variables will be examined: positive alcohol expectancies, alcohol use motivations, and forms of queer social support. To minimize the family-wise error rate, a Bonferroni correction will be used for null-hypothesis testing; therefore, alpha for each t-test will be set to 0.01. Hatzenbuehler (2009) suggests experiences of minority stress relate to these cognitive and interpersonal psychological processes. Further, as it is theorized NOW experience more binegative stress, it is hypothesized that NOW will report on average more positive alcohol expectancies, more alcohol use motivations related to coping, and less queer social support than EOW.

**Hypothesis 4.** Among NOW, the relationship between binegative minority stressors and alcohol use disorder symptoms, will be mediated by positive alcohol expectancies, drinking to cope, and queer social support. Mediation analyses support the theorized processes through which minority stress precipitates alcohol use disorder symptoms.

Binegative minority stressors will be positively related to positive alcohol expectancies and drinking to cope, and negatively related to queer social support. Positive alcohol expectancies and drinking to cope will be positively related to alcohol use disorder symptoms, and queer social support will be negatively related to alcohol use disorders.

Two mediation analyses will be conducted using the PROCESS macro (Hayes, 2012; Preacher & Hayes, 2008), and procedures outlined by Hayes (2013). For each mediation analysis, five conceptual multiple regression analyses will be conducted to determine the specific indirect effects of each proposed statistical mediator on the direct relationship between binegative stressors and disordered alcohol use. The proposed statistical model is rooted in Hatzenbuehler's (2009) Psychological Mediation Framework, which proposes that the relationship between minority stress and health disparities among sexual minority individuals is indirectly affected by cognitive and interpersonal processes. Due to the methodological design of this project, causal relationships in the proposed model cannot be inferred, but support the processes by which minority stress confers disordered alcohol use, through psychosocial factors.

The conceptual regression analyses for the mediation analyses are as follows. The first regression analysis in each mediation analysis will regress alcohol use disorder symptoms on distal or proximal binegative minority stress. Next, three regression analyses will regress positive alcohol expectancies, alcohol use motivations, and queer social support on binegative

stressors, in order to determine specific indirect effects of each on the relationship between binegative stressors and disordered alcohol use. The fifth regression analysis will determine the total effect of psychological processes (positive alcohol expectancies, alcohol use motivations and queer social support) on disordered alcohol use. Demographic variables and general minority stressors will be entered first in each of the regressions. Inferential analysis of the specific indirect effect of each psychological process will rely on bootstrapped standard errors of the effect and 95% confidence intervals. The total indirect effect of psychological processing will be evaluated via bias-corrected bootstrapping confidence intervals. Importantly, due to the cross-sectional methodology, this hypothesis explores bi-directional relationships. Though unidirectional relationships between variables are supported theoretically, the results should not be interpreted in causal terms, but as suggestive of a process between minority stress, interpersonal and cognitive factors, and alcohol use disorder symptoms. .

## **Methods**

### **Recruitment**

Participants were invited to participate via social media platforms (i.e., Facebook, Reddit, Instagram, and Twitter) using both blinded and non-blinded recruitment materials (see Appendix A for blinded recruitment materials). For blinded recruitment, information regarding the study and survey links were posted with four population targets. The survey instrument was copied so that unique links could be shared for different sampling targets, and that participants could be identified by which population they represent. Additionally, two targeted Facebook advertisements were utilized in addition using research assistants for general and LGBTQ+ Womxn (i.e., identify as women, regardless of sex assigned at birth; mxn is a term used to reflect those who identify as men, regardless of sex assigned at birth) targets. To represent this distinction in sampling methods, general and LGBTQ+ womxn samples are stratified by paid advertisement in descriptive information (i.e., General Link, General Facebook Advertisement, Womxn & LGBTQ+ Link, and Womxn & LGBTQ+ Facebook Advertisement). Blinded recruitment materials were disseminated to the following four populations via social media:

- 1) General: health and wellness groups, social science groups, book clubs, etc.
- 2) Womxn: womxn centered empowerment groups, womxn's book clubs, womxn's hiking groups, etc.
- 3) LGBTQ+: queer exchanges, LGBTQ+ community groups, transgender and gender diverse communities, non-monogamous relationship groups, etc.
- 4) Womxn & LGBTQ+: lesbian communities, bisexual womxn groups, queer womxn pages, etc.

Research assistants contacted page and group moderators to request sharing the survey information prior to posting, and matched the survey links to the appropriate population target (e.g., a general link was shared with a psychology research page, a LGBTQ+ link was shared

with a queer exchange group). General populations were also sampled via a targeted Facebook advertisement, which ran from December 2019 to February 2020. The advertisement was targeted towards women between the ages of 18 and 65 who live in the United States, and used blinded study information and materials.

In order to reach the desired sample size required for adequately powered analyses, an additional targeted Facebook advertisement with non-blinded recruitment materials (i.e., requesting LGBTQ+ participants, see Appendices A and B) ran for approximately three weeks in March, 2020. The advertisement was targeted towards women between the ages of 18 and 65 who lived in the United States, and who expressed interest or involvement in LGBTQ+ pages or groups (e.g., , bisexuality, Pride, gender studies, LGBT pride).

### **Screening Procedure and Materials**

Potential participants reviewed and gave informed consent. Potential participants then completed a brief screener, which included masking questions to minimize demand characteristics and to minimize inauthentic reporting of gender and sexuality information. Participants were invited to complete the full survey if they indicated that they were: 1) 18 years of age or older, 2) lived in the United States, 3) identified their gender as something other than cis man or trans man, and 4) indicated either a sexual minority identity (e.g., lesbian, gay, bisexual, pansexual, asexual, or something else) or a heterosexual identity, but indicated a history of either same-gender sexual attraction, or same-gender sexual behavior. Screener response items included the option to identify as “something else” and provide an open-ended response.

Eight-hundred and ninety-one individuals completed the screener across all sampling targets. Across all four targets, stratified into six groups to represent distinctions based on

Facebook advertisements, 560 (62.85%) were eligible to complete the full survey. See Tables 1-4 for information regarding frequencies of screener completion, eligibility rates, and gender identity and sexuality descriptive from the screener.

**Table 1***Eligibility Rates by Sampling Target*

Sample	Eligible (N, %)
General	49 (29.5%)
General Facebook Advertisement	70 (35.9%)
Womxn	26 (50.0%)
LGBTQ+	64 (72.25%)
Womxn and LGBTQ+	44 (88.0%)
LGBTQ+ Facebook Advertisement	308 (88.5%)
Total	560 (63.0%)

**Table 2***Screener Gender Identity Descriptives by Sampling Group*

Sample Group	n	Cisgender Women	Cisgender Men	Transgender Women	Transgender Men	Non-Binary	Something Else
General	166	82 (49.4%)	47 (28.3%)	6 (3.6%)	3 (1.8%)	9 (5.4%)	5 (3.0%)
General FB	195	185 (94.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	0 (0.0%)
Womxn	52	45 (86.5%)	0 (0.0%)	1 (1.9%)	0 (0.0%)	2 (3.8%)	0 (0.0%)
LGBTQ+	80	37 (46.3%)	5 (6.3%)	4 (5.0%)	3 (3.8%)	20 (25.0%)	8 (10.0%)
Womxn and LGBTQ+	50	41 (82.0%)	2 (4.0%)	1 (2.0%)	0 (0.0%)	5 (10%)	0 (0.0%)
LGBTQ+ FB	348	278 (79.9%)	0 (0.0%)	12 (3.4%)	2 (0.6%)	39 (11.2%)	14 (4.0%)
Total	891	668 (75.0%)	54 (6.1%)	24 (2.7%)	8 (0.9%)	77 (8.6%)	27 (3.0%)

**Table 3***Sexual Identity Descriptives by Sampling Group*

Sample Group	n	Gay	Lesbian	Bisexual	Pansexual	Asexual	Heterosexual	Something Else
General	166	2 (1.2%)	8 (4.8%)	28 (16.9%)	12 (7.2%)	7 (4.2%)	39 (23.5%)	5 (3.0%)
General FB	195	2 (1.0%)	6 (3.1%)	26 (13.3%)	4 (2.1%)	9 (4.6%)	135 (69.2%)	3 (1.5%)
Womxn	52	0 (0.0%)	1 (1.9%)	12 (23.1%)	5 (9.6%)	0 (0.0%)	26 (50%)	2 (3.8%)

LGBTQ+	80	2 (2.5%)	14 (17.5%)	13 (16.3%)	19 (23.8%)	7 (8.8%)	3 (3.8%)	9 (11.3%)
Womxn and LGBQ+	50	2 (4.0%)	19 (38.0%)	17 (34.0%)	3 (6.0%)	2 (4.0%)	4 (8.0%)	0 (0.0%)
LGBTQ+ FB	348	6 (1.7%)	59 (17.0%)	141 (40.5%)	56 (16.1%)	23 (6.6%)	29 (8.3%)	22 (6.3%)
Total	891	14 (1.6%)	107(12.0%)	237 (26.6%)	99 (11.1%)	48 (5.4%)	236 (26.5%)	41 (4.6%)

**Table 4***Sexuality Descriptives from Screener by Sampling Group*

Sampling Group	N	Lifetime Same-Gender Sexual Behavior		Lifetime Same-Gender Sexual Attraction	
		Missing	Endorsed	Missing	Endorsed
General	166	65 (39.2%)	32 (19.3%)	65 (39.2%)	52 (31.3%)
General FB	195	8 (4.1%)	49(25.1%)	10 (5.1%)	56 (28.7%)
Womxn	52	6 (11.5%)	18 (34.6%)	6 (11.5%)	25 (48.1%)
LGBTQ+	80	13 (16.3%)	53 (66.3%)	13 (16.3%)	26 (48.1%)
Womxn and LGBTQ+	50	3 (6.0%)	35 (70.0%)	3 (6.0%)	27 (48.1%)
LGBTQ+ FB	348	12 (3.4%)	206 (59.2%)	12 (3.4%)	28 (48.1%)
Total	891	107 (12.0%)	393 (44.1%)	109 (12.2%)	29 (48.1%)

**Sample Descriptives**

Of the 560 ( $M_{age} = 27.74$ ,  $SD_{age} = 9.09$ ,  $Min_{age} = 18$ ,  $Max_{age} = 73$ ) participants eligible for participation, the majority were recruited via the Womxn and LGBQ+ Facebook advertisement ( $n = 308$ , 55.0%), were assigned female at birth ( $n = 497$ , 88.75%) and identified as cisgender ( $n = 444$ , 79.3%). Approximately two-thirds of the sample reported same gender sexual behavior in their lifetime ( $n = 380$ , 67.9%) and the majority of the sample endorsed same gender attraction in their lifetime ( $n = 508$ , 90.7%). The most commonly selected sexual identity in this sample was bisexual ( $n = 228$ , 40.7%), followed by lesbian ( $n = 105$ , 18.8%). The majority of eligible participants indicated that they were currently in a relationship ( $n = 317$ , 56.6%), and three quarters considered themselves monogamous ( $n = 420$ , 75.0%). Nearly half of the participants eligible for participation in the full survey earned a Bachelor's degree or higher ( $n = 259$ , 46.3%), with 80 participants (14.2%) having earned a graduate degree. About one third of the



sample indicated that they were currently attending college (n = 222, 39.6%). The majority of the sample identified their racial/ethnic identity as white (n = 408; 72.9%). Multiracial individuals comprised the next largest racial/ethnic group (n = 78, 13.9%). Forty-six (8.2%) participants reported that they are currently in substance use recovery; however, 16.3% (n = 7) of the participants recruited from Womxn and LGBTQ groups considered themselves to be in recovery from substance misuse. For demographic information stratified by sampling target and method, see Appendix C.

### **Full Survey Procedure**

Upon eligibility determination, participants were asked to complete a survey comprised of 338 individual questions. Not all questions were posed to all respondents (e.g., differing versions were dependent on sexual identity, or alcohol and drug use). Participants had up to three days from the day they initiated the survey to complete it. Upon completion, they were eligible to enter a drawing to win one of five gift cards at a value of \$30 each to Amazon.com. If they chose to do so, they were directed to a separate and non-linked survey in order to provide their email addresses for the drawing. A validity item was posed at the midpoint of the survey (“What is 59 + 13?” with multiple choice answers) to determine random responding.

**Measures.** The survey consisted of four sections: demographic information; gender sexuality and minority stress indices; psychological processes; and, dependent measures. These sections and their attendant measures are described in detail below.

#### ***Gender, Sexuality, and Minority Stress Measures.***

*Heterosexist Harassment, Rejection and Discrimination Scale (HHRDS).* The Heterosexist Harassment, Rejection and Discrimination Scale (Szymanski, 2006) is a 14-item, self-report measure of distal minority stressors (e.g., discrimination, harassment, and rejection).

The HHRSD utilizes a 6-point Likert-type response format (0 = *Never happened to you*, 5 = *Almost all of the time*). Higher composite scores indicate more distal minority stress (Sample Item: “*How many times have you been made fun of, picked on, pushed, shoved, hit, or threatened with harm because of your sexual orientation?*”). The HHRDS has an overall reported internal consistency of 0.90, with its three subscales demonstrating fair to good internal consistency (Harassment and Rejection = 0.89; Workplace and School Discrimination = 0.84; Other Discrimination = 0.78). The HHRSD has been validated for use among sexual minority samples including lesbians, gay men and bisexual men (Szymanski, 2006). Further, the HHRSD evidences adequate construct validity, as it is positively correlated with psychological distress. For participants in this study who completed the HHRDS (n = 291), the internal reliability coefficients across the total scale ranged from acceptable to excellent: Heterosexist Experiences (Total;  $\alpha = 0.91$ ), Harassment and Rejection ( $\alpha = 0.87$ ), Workplace and School Discrimination ( $\alpha = 0.82$ ), and Other Discrimination ( $\alpha = 0.77$ ).

*Lesbian, Gay and Bisexual Identity Scale (LGBIS)*. The Lesbian, Gay and Bisexual Identity Scale (Mohr & Kendra, 2011) is a 27-item, self-report, multi-dimensional assessment of sexual minority identity distress. Scores are derived by summing across each subscale or all 27-items. Higher scores indicate more proximal minority stress. The LGBIS utilizes 6-point Likert-type response scales (1 = *strongly disagree*, 6 = *strongly agree*; Sample Item: “*I believe it is unfair that I am attracted to people of the same sex.*”). Three subscales assess proximal minority stress processes: Acceptance Concerns, Internalized Homonegativity, and Concealment Motivation. Each subscale consists of 3-items, and demonstrates convergent validity with similar established, yet outdated, measures of proximal minority stress (e.g., Internalized Homonegativity was highly correlated with the Ego-Dystonia Homosexuality Scale; Martin &

Dean, 1987). The LGBIS evidences good reliability, as internal consistency between each subscale ranges from 0.72 and 0.94. Further, six-week test-retest correlation coefficients across the subscales ranged from 0.70 to 0.92. The internal consistency coefficients for each subscale in this sample ( $n = 288$ ) fell in the good and acceptance ranges: Acceptance Concerns ( $\alpha = 0.77$ ), Internalized Homonegativity ( $\alpha = 0.83$ ), and Concealment Motivation ( $\alpha = 0.84$ ).

*Bisexual Minority Stress Scale (BMSS)*. The Bisexual Minority Stress Scale (Balsam, Beadnell, & Molina, 2013) is a 10-item self-report measure of distal bi-negative minority stressors with Likert-type responses ranging from 0 = *Never* to 5 = *Almost Every Day* (Sample item: “*Being asked ‘when are you going to come out all the way?’*”). Higher scores indicate more experiences of distal binegative stressors. Published internal consistency coefficients fall in the fair range ( $\alpha = 0.76$ ). The BMSS demonstrates adequate content validity, as it was developed using focus groups and in-depth interviews concerning bisexual experiences of distress. In this sample ( $n = 280$ ), the internal reliability coefficients fall in the good range ( $\alpha = 0.84$ ).

*Bisexual Identity Inventory (BII)*. The Bisexual Identity Inventory is a 24-item self-report measure of proximal bi-negative distress. Responses are rated on a 7-point Likert-type scale from 0 = *strongly disagree* to 6 = *strongly agree* (Sample Item: “*I wish I could control my feelings by directing them at a single gender.*”). The BII includes four dimensions of bisexual identity distress: Illegitimacy of Bisexuality, Anticipated Binegativity, Internalized Binegativity, and Identity Affirmation (reverse scored). Scores are derived from summing responses for each subscale, and across the full questionnaire. Published internal consistency coefficients across the full scale and each of these subscales are in the acceptable to excellent ranges ( $\alpha = 0.73 - 0.93$ ; Paul, Smith, Mohr, & Ross, 2014). The BII demonstrates adequate content validity due to its

construction, which utilized rational derivation of items. In this sample ( $n = 281$ ), internal consistency coefficient fell in the acceptable range across the full scale ( $\alpha = 0.76$ ).

***Psychological Processes Measures.***

*Medical Outcome Study – Social Support Scale (MOS-SSS).* To assess for social support participants responded to the Medical Outcome Study – Social Support Scale (MOS-SSS; Sherbourne & Stewart, 1991) twice. Instructions requested that participants respond to the items in relation to support received from members of the queer community, and in relation to members outside the queer community. The MOS-SSS is an 18-item, multidimensional instrument that measures the following facets of social support: Emotional-Informational, Tangible, Affectionate, and Positive Social Interaction. Item responses range from 0 (*none of the time*) to 4 (*all of the time*), with higher scores indicated a high level of social support (Instructions: “*How often is each of the following kinds of support available to you if you need it, from people who ARE not a part of the LGBTQ+ community?*” Sample Item: “*Someone to share your most private worries and fear with*”). The MOS-SSS has high internal consistency, with each subscale ranging from 0.91 to 0.96, and a total scale Cronbach’s  $\alpha = 0.97$ . The MOS-SSS has demonstrated concurrent validity, as evidence by a strong negative correlation with measures of loneliness. Internal consistency coefficients in this sample fell in the excellent range across all subscales and full scales. See Table 5 for MOS-SSS reliability coefficients for each overall score and subscales.

**Table 5**

*Reliability Coefficients for Medical Outcomes Survey-Social Support Scale*

<u>Subscales</u>	<u>Internal Consistency (Cronbach’s <math>\alpha</math>)</u>	
	<u>Queer Social Support</u>	<u>Non-Queer Social Support</u>
Emotional and Information Support	0.96	0.97

Tangible Support	0.96	0.97
Affectionate Support	0.92	0.94
Positive Social Interactions	0.95	0.96
<hr/>		
Total Social Support	0.97	0.97

*Drinking Motives Questionnaire- Revised (DMQ-R).* The Drinking Motives Questionnaire- Revised (DMQ-R; Blackwell & Conrod, 2003; Grant, Stewart, O'Connor, Blackwell, & Conrod, 2007) is a 20-item self-report measure of four dimensions of drinking motivations: Social, Coping, Enhancement and Social Pressure and Conformity. Participants describe how frequently their drinking is motivated by each of the items (Sample Items: “*To forget your worries*”, “*Because it helps you enjoy a party*”, “*So you won't feel left out*”). Item responses are Likert-type items on a five point scale (0 = *almost never/never*, 4 = *almost always/always*). Each subscale demonstrates adequate internal consistency, with published internal consistency coefficients ranging from 0.73 to 0.89. Though originally developed with an adolescent sample, the DMQ-R shows adequate construct validity in adults (Perkins, 1999; MacLean & Lecci, 2000; Grant et al., 2007). Further, the DMQ-R shows concurrent validity with frequency of alcohol use and alcohol consumption. In this sample (n =288), the internal consistency coefficients fell in the good to excellent ranges: Social ( $\alpha = 0.92$ ), Coping ( $\alpha = 0.90$ ), Enhancement ( $\alpha = 0.88$ ), and Social Pressure and Conformity ( $\alpha = 0.81$ ).

*Comprehensive Effects of Alcohol Questionnaire (CEoA).* The Comprehensive Effects of Alcohol Questionnaire (Fromme, Stroot, & Kaplan, 1993) is a 36-item, self-report measure of alcohol expectancies. The CEoA assesses positive and negative alcohol use outcome expectancies, as well as positive and negative evaluations of those potential outcomes (Sample Item: “*If I were under the influence of alcohol, it would be easier to express feelings*”). Participants respond using a 4 point Likert-type scale how likely to occur that outcome is (0 = *Disagree*, 3 = *Agree*), and provide subjective evaluations of the effects, regardless of whether

they expect the effect would happen to them on a 5-point Likert-type scale (0 = *Bad*, 4 = *Good*). This measure is widely used in college student populations and demonstrates adequate construct validity across its four subscales (*Positive Expectancies*, *Positive Evaluation*, *Negative Expectancies*, and *Negative Evaluation*). Reported internal consistency coefficients of these four subscales range from 0.85 to 0.93. In this sample, the internal consistency coefficients for *Positive Expectancies* fell in the excellent range ( $\alpha = 0.95$ ).

#### ***Dependent Variable Measures.***

*The Alcohol Use Disorder Identification Test (AUDIT).* The AUDIT is a 10-item self-report questionnaire that measures alcohol consumption, drinking behavior and alcohol-related problems. Higher scores indicate more hazardous alcohol consumption. Composite scores at or above 8 on the AUDIT suggest disordered alcohol use. Three subscales assess specific alcohol use related concerns: Consumption, Negative Consequences Due to Alcohol Use, and Dependency. The AUDIT demonstrates good criterion-validity, as initial developers of the AUDIT indicated that a cutoff-score of 8 resulted in reflecting 95% to 100% of participants with current hazardous alcohol use, and 100% of participants were diagnosed with alcohol dependency (World Health Organization, 2001). The AUDIT demonstrates high internal consistency with a reported Cronbach's alpha of 0.93 (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). Internal consistency coefficients in this sample ranged from acceptable to excellent, across total AUDIT scores ( $\alpha = 0.91$ ), and each subscale: Consumption ( $\alpha = 0.78$ ), Negative Consequences Due to Alcohol Use ( $\alpha = 0.78$ ), and Dependency ( $\alpha = 0.89$ ).

#### **Data Handling and Analytic Strategy**

Data collection was accomplished via Qualtrics, and results were converted to SPSS files. Data cleaning, variable computation and descriptive statistics were carried out in SPSS Version 25 (IBM Corporation, 2017). Figures were generated in Microsoft Excel.

Two versions of the survey were distributed, one of which was designed to be compatible with screen readers for the visually-impaired. A less accessible version was made available so as to make completion of the survey more expedient for those participants not requiring accessibility. For each of the variables of interest, data from the accessible and inaccessible versions were merged. Items were rescored according to predetermined scales, or reverse scored for particular items as necessary.

Total scores were calculated for each scale or subscale representing facets of minority stress, psychological processes, or disordered alcohol use. Full scales in this project include: Heterosexist Experiences (i.e., distal general minority stress, via the HHRDS), Distal Binegative Stress (via the BMSS), Proximal Binegative Minority Stress (via the BII), Alcohol Use Disorder Symptoms (AUD; via the AUDIT), and Queer Social Support (QSS; via the MOSS-SSS-Q). The following subscales reflect the remainder of the constructs: Acceptance Concerns (i.e., the represents the proximal minority stress process expectations of rejection), Internalized Homonegativity, and Concealment (i.e., proximal general minority stress processes via the LGBIS); Positive Alcohol Expectancies (via the CEoA) and Drinking to Cope (via the DMQ-R). These scores were tabulated for those participants who completed at least 80% of the items in a given scale. Scores for the full scale and subscales of the AUDIT were log-transformed to account for positive skew common in substance use measures.

### **Inclusion Criteria for Analyses**

Of the 560 participants who were eligible to complete the full survey, 80 (14.3%) participants identified their gender identity as non-binary, 22 (3.9%) indicated their gender identity as non-cisgender or “something else”, and were excluded from the following analyses. Additionally, eight percent of the eligible sample identified their sexual identity as asexual (n = 45), and were excluded from the following analyses. These participants’ (n = 128) responses will be utilized for additional research projects. Therefore, 432 participants met criteria as either an EOW or NOW. One hundred and eleven NOW or EOW respondents did not complete the validity item (25.7%) and 13 participants did not answer the item correctly (3.0%), and were excluded from the analyses. Three hundred and eight NOW or EOW answered the item correctly (71.3%).



## Results

### Hypothesis 1: Cumulative Minority Stress Comparisons

**Sample information.** Of the 308 NOW or EOW, 217 (70.45%) were included in the analyses for the first hypothesis. In order to be included for these analyses, respondents had to: 1) complete at least 80% of the full survey, and 2) complete the measures required for this analysis. The majority of participants ( $n = 198, 92.1\%$ ) completed less than 50% of the survey, and the remainder ( $n = 17$ ) were excluded due to not completing at least 80% of the measures required for these analyses. The age of this sample ranged from 18 – 63 ( $M_{age} = 27.74, SD_{age} = 9.09$ ). Most of this sample identified as cisgender ( $n = 208, 95.9\%$ ) and the majority identified their racial/ethnic identity as white ( $n = 155, 71.4\%$ ). The majority of participants indicated that they were currently in a romantic relationship ( $n = 146, 67.3\%$ ) and 62 (28.6%) reported that they considered themselves non-monogamous. About forty percent of participants in this sample reported that they were currently attending college or university ( $n = 88, 40.6\%$ ), and 54.5% of this sample indicated that they had earned a Bachelor's degree or higher. The majority of participants indicated that they are not in substance use recovery ( $n = 200; 92.2\%$ ), and were recruited via the Womxn and LGBQ+ Facebook advertisement ( $n = 126, 58.1\%$ ).

**Grouping.** Participants were grouped into NOW and EOW based on their sexual identity, and this variable was conceptualized as a fixed factor. NOW ( $n = 199, 91.70\%$ ) were comprised of those who identified bisexual, pansexual, queer, questioning, or heterosexual (who also indicated either lifetime same-gender attraction or sexual behavior with people of the same gender). EOW were comprised of those who identified as gay or lesbian.

**Univariates and Bivariates.** Univariate descriptives were conducted for each variable (Table 6). These scores represent both NOW and EOW, due to the aims of this analysis. The

ranges of scores obtained for Heterosexist Experiences (Sample Range = 14-61, Possible Range = 0-70), Distal Binegative Minority Stress (Sample Range = 0-46, Possible Range = 0-50), and Proximal Binegative Minority Stress (Sample Range = 3-84, Possible Range = 0 -144) did not represent the full range of possible scores. The actual range for Heterosexist Experiences reflects neither the upper nor the lower ends of the measure, suggesting a potential restriction in range. However, given this measure samples experiences of discrimination and stigma, which are pervasive experiences for sexual minority womxn, this may reflect the reality that living a life without discrimination, prejudice or stigma is relatively uncommon for this population.

**Table 6**

*Univariates for General and Binegative Minority Stress Measures*

Measures	M (SD)	Median	Possible Range	Min, Max
Acceptance Concerns	6.24 (3.82)	7.00	0-15	0.00, 15.00
Concealment	7.28 (4.03)	7.00	0-15	0.00, 15.00
Internalized Homonegativity	2.18 (2.91)	1.00	0-15	0.00, 13.00
Heterosexist Experiences	25.43 (10.62)	22.00	0-70	14.00, 61.00
Distal Binegative Minority Stress	20.06 (9.91)	20.00	0-50	0.00, 46.00
Proximal Binegative Minority Stress	37.94 (14.00)	39.00	0-144	3.00, 84.00

The obtained range of scores for the Distal Binegative Minority Stress and Proximal Binegative Minority Stress scales reflect lower scores, but not higher scores, resulting in a restricted range along the uppermost end of these measures. Although the reasons for these responding patterns remain unknown, several reasons may explain this distribution of data. One potential reason for this restriction in range, may suggest that the population of NOW do not experience high levels of distal or proximal binegative stressors. However, this is unlikely, as other studies that studied bisexual women did not report a similar restriction in range (e.g., Yost, 2009; Molina et al., 2016; Paul et al., 2014; Balsam, Beadnell, & Molina, 2013). Therefore, another reason for this restriction in range may be due to oversampling NOW who experience

fewer distal and proximal binegative stressors. Given the high proportion of participants recruited from affirmative communities, this may explain, in part, the restricted range of scores on the BII and the BMSS. It is possible that the participants represented in this study experience less discrimination and internalized stigma due to their connection with affirming communities.

In addition to a sampling bias, this restriction in range may also reflect a demand characteristic. A demand effect might be elicited by the measures utilized in the survey, the communities which the survey link was posted, or the non-blinded recruitment materials. These materials and settings may have “demanded” that participants respond to the survey in ways to minimize their internalizations of stigma, or experiences of discrimination. In addition to a demand characteristic, participants may also have respond to the Bisexual Identity Inventory, which includes rather explicit internalizations of binegative stigma (e.g., Sample Items: “*I am not a real person because I am bisexual*”, “*Being bisexual is just a cop out*”, “*Bisexuality is not a real identity*”, “*My life would be better if I were not bisexual*”), in a socially desirable way (i.e., being “out and proud” in accordance with queer community norms and expectations). Altogether, sampling biases, demand characteristics, and socially desirable responding may account for the restriction in ranges in the Bisexual Identity Inventory and Bisexual Minority Stress Scale scores, although the reasons are not known.

Zero-order correlations between each combination of variables were also conducted (Table 7). Acceptance Concerns were positively correlated with both distal and proximal general minority stressors, and Distal Binegative Minority Stress, but not Proximal Binegative Minority Stress. Concealment was positively associated with each proximal general minority stressor, both distal and proximal binegative minority stress, but not Heterosexist Experiences. Internalized Homonegativity was positively correlated with Acceptance Concerns, Concealment,

and Binegative Proximal Minority Stress. Heterosexist Experiences were positively related to Concealment, and Distal Binegative Minority Stress, but not Proximal Binegative Minority Stress. Distal Binegative Minority Stress was not related to Proximal Binegative Minority Stress.

**Table 7**

*Zero Order Correlations of General and Binegative Minority Stressors*

	1	2	3	4	5	6
1. Acceptance Concerns	1.000					
2. Concealment Motivation	0.397**	1.000				
3. Internalized Homonegativity	0.317**	0.324**	1.000			
4. Distal General Minority Stress	0.210**	-0.043	0.071	1.000		
5. Distal Binegative Minority Stress	0.432**	0.309**	-0.016	0.301**	1.000	
6. Proximal Binegative Minority Stress	0.161*	0.308**	0.416**	0.058	0.129	1.000

\*=  $p < .05$ , \*\* =  $p < .01$

**Results.** For a description of the assumption tests for this analysis, see Appendix D. Although assumptions were not met, we proceeded with the planned analysis, interpreting results with caution. To determine whether NOW and EOW report differences with regard to experiences of cumulative minority stress, a one-way multivariate analysis of variance (MANOVA) was conducted. The following variables were entered as dependent variables to reflect the construct minority stress: binegative minority stressors (Distal Binegative Minority Stress and Proximal Binegative Minority Stress), and general minority stressors (Heterosexist Experiences, Acceptance Concerns, Concealment, and Internalized Homonegativity).

**Table 8***Multivariate Test Statistics for Cumulative Minority Stress Load between NOW and EOW*

Multivariate Test	Test Statistic
Pillai's Trace	0.244**
Wilks' Lambda	0.756**
Hotelling's Trace	0.323**

\*\* =  $p < .01$ 

Equality of error variances of each dependent variable, assessed via Levene's Test, is assumed for all variables except Heterosexist Experiences (*Levene's Statistic* = 4.622,  $p = 0.033$ ) and Proximal Binegative Minority Stress (*Levene's Statistic* = 17.947,  $p < .001$ ). As MANOVA assumptions were not met and caution in interpretation is warranted, this author elected to include several multivariate test statistics for interpretation. All multivariate test statistics yielded probabilities less than .001, including the most robust and conservative multivariate statistic, Pillai's Trace (*Pillai's Trace* = 0.244,  $p < 0.001$ ). This test indicates that cumulative minority stress differed between NOW and EOW ( $F(6, 210) = 11.289$ ,  $p < 0.001$ , *Wilks'  $\Lambda$*  = 0.756, *Partial  $\eta^2$*  = 0.244); 24.4% of the variance in cumulative minority stress is accounted for by the exclusive versus non-exclusive orientation.

Univariate comparisons of NOW and EOW by each minority stress measure were conducted to identify differences based on specific minority stress processes unique to NOW. NOW reported higher levels of Acceptance Concerns ( $F(1, 215) = 4.128$ ,  $p = 0.043$ , *Partial  $\eta^2$*  = 0.019), Concealment ( $F(1, 215) = 20.489$ ,  $p < 0.001$ , *Partial  $\eta^2$*  = 0.087), and Distal Binegative Minority Stress ( $F(1, 215) = 25.015$ ,  $p < 0.001$ , *Partial  $\eta^2$*  = 0.104) than EOW. However, EOW reported more Heterosexist Experiences ( $F(1, 215) = 11.16$ ,  $p = 0.001$ , *Partial  $\eta^2$*  = 0.051). No mean differences were identified between NOW and EOW on Proximal Binegative Minority Stress ( $p = 0.255$ ) nor Internalized Homonegativity ( $p = 0.654$ ).

**Table 9***Mean Differences on General and Binegative Minority Stressors*

Minority Stressor	NOW ( <i>M, SD</i> )	EOW ( <i>M, SD</i> )	Total ( <i>M, SD</i> )
Acceptance Concerns	6.40, 3.80	4.50, 3.70	6.24, 3.82
Concealment	7.64, 3.92	3.33, 3.14	7.28, 3.92
Internalized Homonegativity	2.21, 2.91	1.89, 3.00	2.18, 2.91
Heterosexist Experiences	24.71, 9.95	33.39, 14.36	25.43, 10.62
Distal Binegative Minority Stress	21.02, 9.58	9.44, 7.05	20.06, 9.91
Proximal Binegative Minority Stress	38.27, 13.21	34.33, 21.14	37.94, 14.01

**Hypothesis 2: Bi-negative Minority Stress and AUD Symptoms**

*Sample information.* In order to be included in this analysis, participants had to: 1) complete 80% or more of the full survey, 2) complete the items necessary for this analysis, 3) indicate that they had consumed an alcoholic beverage in the past year, and 4) be classified as NOW. One hundred and sixty-two participants met these criteria. The age of this sample ranged from 18 – 63 ( $M_{age} = 27.43$ ,  $SD_{age} = 8.63$ ). About two-thirds of this sample identified as bisexual ( $n = 114$ , 65.5%), and the majority were recruited via the Womxn and LGBTQ+ Facebook advertisement ( $n = 104$ , 59.8%). Most of this sample identified as cisgender ( $n = 154$ , 95.1%) and the majority identified their racial/ethnic identity as white ( $n = 155$ , 93.9%). The majority of participants indicated that they were currently in a romantic relationship ( $n = 121$ , 69.5%) and 50 (28.67%) reported that they considered themselves non-monogamous. About forty percent of participants in this sample reported that they were currently attending college or university ( $n = 70$ , 40.2%), and 52.2% ( $n = 91$ ) of this sample indicated that they had earned a Bachelor's degree or higher. The majority of this sample indicated that their yearly household income was \$40,000 or less ( $n = 102$ , 59.3%), and the most often occurring yearly income range was \$10,001 – \$20,000 ( $n = 31$ , 18.0%). The majority of participants indicated that they are not in substance use recovery ( $n = 162$ ; 93.1%). The majority of participants were recruited via the Womxn and LGBTQ+ Facebook advertisement ( $n = 116$ , 71.6%).

*Univariates and Bivariates.* Univariate descriptives were conducted for the raw and log-transformed AUDIT scores. This information represents NOW, as the aims of this analysis center on variables related to Alcohol Use Disorder symptoms among this specific sexual minority group. The average and median AUDIT scores for this sample fall above the cut-off score, indicating low risk (Score = 7). The highest possible score on the AUDIT (Score = 40) was not represented in the sample; however, scores greater than 20 on the AUDIT indicate high-risk for alcohol use disorder (World Health Organization, 2001). Univariate information regarding general and binegative minority stressors is presented in the results for hypothesis one.

**Table 10**

*Univariate Information for the Alcohol Use Disorder Identification Test (AUDIT)*

	<u>M (SD)</u>	<u>Median</u>	<u>Min, Max</u>
AUDIT (Raw)	10.37 (6.31)	10.00	0.00, 36.00
AUDIT (Log Transformed)	0.90 (0.37)	1.00	0.00, 1.56

Zero-order correlations were conducted on the independent and dependent variables (see Table 11). AUD was positively correlated with Acceptance Concerns, Heterosexist Experiences, and Distal Binegative Minority stress, but no other general or binegative minority stressors. Relationships between general and binegative minority stressors are described in the results section for the first hypothesis.

**Table 11***Zero-order Correlations of Minority Stressors and Alcohol Use Disorder Symptoms*

	1.	2.	3.	4.	5.	6.
1. Alcohol Use Disorder	1.000					
2. Acceptance Concerns	0.391**	1.000				
3. Concealment	0.031	0.338**	1.000			
4. Internalized Homonegativity	0.089	0.294**	0.310**	1.000		
5. Heterosexist Experiences	0.174*	0.306**	0.036	0.107	1.000	
6. Distal Binegative Minority Stress	0.353**	0.404**	0.196**	-0.043	0.481**	1.000
7. Proximal Binegative Minority Stress	-0.060	0.144	0.311**	0.475**	0.064	0.058

\* =  $p < 0.05$ , \*\* =  $p < 0.01$ 

**Results.** Assumptions for multiple linear regression analysis were not rejected. For a description of the assumption tests for this analysis, see Appendix E. In order to determine the amount of variance in Alcohol Use Disorder symptoms accounted for by general minority stressors and binegative minority stressors, a hierarchical multiple regression was conducted. In the first step of the regression, the following covariates were entered: age, college student status, relationship status, income, and racial/ethnic identity. Due to small sample sizes of people of color, racial/ethnic identity was recoded into a categorical variable (i.e., person of color or white). In the second step of the regression, general minority stressors were entered: Acceptance Concerns, Concealment, Internalized Homonegativity, and Heterosexist Experiences. In the third and final step of the analysis, binegative minority stressors were entered: Distal Binegative Minority Stress and Proximal Binegative Minority Stress. Covariates and independent variables predicted Alcohol Use Disorder symptoms (Table 12).



**Table 12**

*Hierarchical Multiple Regression of General Minority Stressors and Binegative Minority Stressors on Alcohol Use Disorder Symptoms*

<b>Step 1: Covariates</b>	<b><math>\beta</math></b>	<b>SE</b>	<b>T</b>	<b>p</b>
Age	-0.375	0.003	-4.706	< 0.001
College Student Status	0.040	0.058	0.505	0.064
Relationship Status	0.127	0.057	1.690	0.093
Income	-0.015	0.009	-0.201	0.841
Racial/Ethnic Identity	0.089	0.111	1.212	0.227
<b>Step 2: General Minority Stressors</b>				
Acceptance Concerns	0.231	0.009	2.603	0.010
Concealment	-0.159	0.007	-2.012	0.046
Internalized Homonegativity	0.097	0.011	1.193	0.235
Heterosexist Experiences	0.095	0.003	1.246	0.215
<b>Step 3: Binegative Minority Stress</b>				
Distal Binegative Minority Stress	0.191	0.003	2.098	0.038
Proximal Binegative Minority Stress	-0.164	0.002	-2.022	0.045

Covariates accounted for 14.1% percent of the variance in Alcohol Use Disorder symptoms ( $F(5, 156) = 6.289, p < 0.001$ ); however, of the covariates, only age was negatively related to Alcohol Use Disorder symptoms ( $\beta = -0.375, t = -4.706, p < 0.001$ ), indicating that younger NOW reported more Alcohol Use Disorder symptoms. The inclusion of general minority stressors improved the model ( $F$ -change (4, 152) = 3.701,  $p = 0.007$ ). General minority stressors accounted for an additional 5.6% of the variance in Alcohol Use Disorder symptoms ( $F(9, 152) = 5.381, p < .001$ ). Acceptance Concerns ( $\beta = 0.231, t = 2.603, p = 0.010$ ) and Concealment ( $\beta = -0.159, t = -2.021, p = 0.046$ ) were the only general minority stressors related to Alcohol Use Disorder symptoms. Surprisingly, Concealment was negatively related to Alcohol Use Disorder symptoms, such that more concealment was associated with fewer Alcohol Use Disorder symptoms. Binegative minority stressors in the model accounted for an additional 3.3% of the variance in Alcohol Use Disorder symptoms ( $F(11, 150) = 5.365, p < 0.001$ ), and improved the model ( $F$ -change (2, 150) = 4.258,  $p = 0.016$ ). Distal ( $\beta = 0.191, t =$

2.098,  $p = 0.038$ ). Proximal Binegative Minority Stressors ( $\beta = -0.164$ ,  $t = -2.022$ ,  $p = 0.045$ ) were related to Alcohol Use Disorder symptoms. However, Proximal Binegative Minority Stress was negatively related to Alcohol Use Disorder symptoms, such that NOW who reported higher Proximal Binegative Minority Stress reported fewer Alcohol Use Disorder symptoms.

### **Hypotheses 3: Psychological Processes Comparisons**

#### ***Hypothesis 3a, Queer Social Support.***

*Sample information.* In order to be included in this analysis, participants had to complete 80% or more of the full survey, and complete the items necessary for this analysis. Of the 308 eligible participants to complete the full survey, 262 met these criteria (85.1%). The age of this sample ranged from 18 – 66 ( $M_{age} = 26.43$ ,  $SD_{age} = 8.03$ ). About half of this sample identified as bisexual ( $n = 137$ , 52.3%), and about one-fifth identified as lesbian ( $n = 52$ , 19.8%); other participants identified as gay ( $n = 7$ , 2.7%), pansexual ( $n = 43$ , 16.4%), heterosexual ( $n = 15$ , 5.7%), and queer ( $n = 8$ , 3.1%). Most of this sample identified as cisgender women ( $n = 250$ , 95.4%) and the majority identified their racial/ethnic identity as white ( $n = 233$ , 88.9%). The majority of participants indicated that they were currently in a romantic relationship ( $n = 163$ , 62.2%) and 56 (21.4%) reported that they considered themselves non-monogamous. Almost half of the participants in this sample reported that they were currently attending college or university ( $n = 124$ , 47.3%), and 50.0% ( $n = 131$ ) of this sample indicated that they had earned a Bachelor's degree or higher. The majority of this sample indicated that their yearly household income was \$40,000 or less ( $n = 155$ , 59.8%), and the most frequently occurring yearly income range was \$10,001 – \$20,000 ( $n = 46$ , 17.8%). The majority of participants indicated that they are not in substance use recovery ( $n = 242$ ; 92.4%). The majority of participants were recruited via the Womxn and LGBTQ+ Facebook advertisement ( $n = 199$ , 76.0%).

*Univariates.* Univariate descriptive (i.e., mean, standard deviation, median, and minimum and maximum scores) were conducted for the full scale and subscales of the MOS-SS for queer social support. This information represents both NOW and EOW, as these analyses aim to identify differences between these two sexual minority groups. Across the full scale and subscales of the Medical Outcomes Survey-Social Support Scale- Queer (MOS-SSS-Q), the means and medians are relatively close, suggesting a somewhat symmetrical distribution. Additionally, the full range of scores was represented across each construct, indicating no presence of a restriction of range, or floor or ceiling effects (Table 13).

**Table 13**

*Univariates for the Medical Outcomes Survey –Social Support Survey – Queer*

<b>Subscale</b>	<i>M (SD)</i>	Median	Min, Max
Emotional and Instrumental	26.85 (8.98)	28.00	8.00, 40.00
Tangible	10.76 (5.55)	10.00	4.00, 20.00
Affective	9.91 (4.00)	10.00	3.00, 15.00
Positive Social Interactions	10.54 (3.60)	11.00	3.00, 15.00
Total Social Support	58.06 (19.16)	58.00	18.00, 90.00

**Results.** In order to identify whether NOW and EOW report differences in Queer Social Support, independent samples t-tests were conducted. Mean scores across the full scale and subscales of the MOS-SSS-Q were compared between NOW (n = 203) and EOW (n = 59). To correct for committing a Type I error in this series of analyses, probabilities are evaluated based on a Bonferroni-corrected alpha ( $\alpha = .01$ ) for five analyses. Levene's Test for Equality of Variances was conducted for each comparison. The assumption of equal variances was assumed for all five comparisons, as the probability associated with each Levene's statistic fell above  $p = 0.05$ . Mean differences in Queer Social Support between NOW and EOW were not identified.

**Table 14***NOW vs. EOW Mean Queer Social Support*

<b>Subscales</b>	<i>M (SD)</i>		<u>T-Scores, p</u>
	<u>NOW</u>	<u>EOW</u>	
Emotional and Instrumental	26.80 (8.85)	27.02 (9.51)	0.164, p = .870
Tangibles	10.52 (5.43)	11.58 (5.92)	0.158, p = .875
Affective	9.83 (3.95)	10.24 (4.16)	1.225, p = .224
Positive Social Interactions	10.46 (3.58)	10.80 (3.69)	0.693, p = .489
Total Social Support	57.61 (18.63)	59.63 (20.96)	0.711, p = .478

***Hypothesis 3b, Drinking Motivations.***

*Sample information.* In order to be included in this analysis, participants had to complete 80% or more of the full survey and complete the items necessary for this analysis. Of the 308 NOW or EOW participants, 288 met these criteria (91.6%). The age of this sample ranged from 18 – 66 ( $M_{age} = 27.69$ ,  $SD_{age} = 9.31$ ). About half of this sample identified as bisexual (n = 143, 49.7%), and about one-fifth identified as lesbian (n = 53, 21.5%); other participants identified as gay (n = 9, 3.1%), pansexual (n = 43, 14.9%), heterosexual (n = 31, 10.8%), and queer (n = 9, 3.1%). Most of this sample identified as cisgender women (n = 275, 95.5%) and the majority identified their racial/ethnic identity as white (n = 250, 92.9%). The majority of participants indicated that they were currently in a romantic relationship (n = 183, 63.2%) and 62 (21.5%) reported that they considered themselves non-monogamous. About forty percent of the participants in this sample reported that they were currently attending college or university (n = 119, 41.3%), and 53.1% (n = 153) of this sample indicated that they had earned a Bachelor's degree or higher. The majority of this sample indicated that their yearly household income was \$40,000 or less (n = 173, 60.7%), and the most often occurring yearly income range was "Less than \$10,000" (n = 47, 16.5%). The majority of participants indicated that they are not in

substance use recovery ( $n = 261$ ; 90.6%). The majority of participants were recruited via the Womxn and LGBTQ+ Facebook advertisement ( $n = 169$ , 58.7%).

*Univariates.* Univariate descriptives (Table 15) were conducted for the Drinking to Cope subscale of the DMQ-R. This information represents both NOW and EOW, as these analyses aim to identify differences between these two sexual minority groups. The full range of scores was represented for this subscale, suggesting no presence of restriction of range, ceiling, nor floor effects.

**Table 15**

*Univariate Information for the Drinking to Cope Subscale of the Drinking Motives Questionnaire-Revised*

	<u><i>M (SD)</i></u>	<u><i>Median</i></u>	<u><i>Min, Max</i></u>
Drinking to Cope	9.86 (5.27)	8.00	5.00, 25.00

**Results.** An independent samples t-test was conducted in order to identify whether NOW and EOW report differences in using alcohol to cope. Mean scores on the Drinking to Cope subscale of the DMQ-R were compared between NOW ( $n = 226$ ) and EOW ( $n = 62$ ). Levene's Test for Equality of Variances was conducted for this comparison ( $F(1, 286) = 3.065, p = .081$ ) and was not rejected. A mean difference ( $t = -2.014, p = .045$ ) of using Drinking to Cope was identified between NOW ( $M = 10.19, SD = 5.44$ ) and EOW ( $M = 8.68, SD = 4.41$ ), indicating that on average, NOW report Drinking to Cope more than EOW.

***Hypothesis 3c, Positive Alcohol Expectancies.***

*Sample information.* In order to be included in this analysis, participants had to complete 80% or more of the full survey and complete the items necessary for this analysis. Of the 308 NOW or EOW participants, 204 met these criteria (66.2%). The age of this sample ranged from 18 – 66 ( $M_{age} = 27.69, SD_{age} = 9.31$ ). Half of this sample identified as bisexual ( $n = 102, 50.0%$ ),

and about one-fifth identified as lesbian (n = 43, 21.1%); other participants identified as gay (n = 4, 2.0%), pansexual (n = 30, 14.7%), heterosexual (n = 21, 10.3%), and queer (n = 4, 2.0%). Most of this sample identified as cisgender women (n = 193, 94.6%) and the majority identified their racial/ethnic identity as white (n = 171, 83.8%). The majority of participants indicated that they were currently in a romantic relationship (n = 123, 60.3%) and 44 (21.6%) reported that they considered themselves non-monogamous. About forty percent of the participants in this sample reported that they were currently attending college or university (n = 80, 39.2%), and 52.9% (n = 108) of this sample indicated that they had earned a Bachelor's degree or higher. The majority of this sample indicated that their yearly household income was \$40,000 or less (n = 125, 61.9%), and the most often occurring yearly income range was "Less than \$10,000" (n = 33, 16.3%). The majority of participants indicated that they are not in substance use recovery (n = 186; 91.2%). The majority of participants were recruited via the Womxn and LGBTQ+ Facebook advertisement (n = 118, 57.8%).

*Univariates.* Univariate descriptives (Table 16) were conducted for the Positive Alcohol Expectancies subscale of the Comprehensive Effects of Alcohol Questionnaire. This information represents both NOW and EOW. The median and average score on the Positive Alcohol Expectancies subscale are close in proximity, suggesting a relatively symmetric distribution. The lowest possible score (score = 1.00) was not represented, suggesting a possible restriction in range or ceiling effect.

**Table 16**

*Univariate Information for the Positive Alcohol Expectancy Subscale from the Comprehensive Effects of Alcohol Questionnaire*

	<u><i>M (SD)</i></u>	<u>Median</u>	<u>Min, Max</u>
Positive Alcohol Expectancies	3.20 (0.73)	3.15	1.15, 5.00

**Results.** An independent samples t-test was conducted in order to identify whether NOW and EOW report differences in positive alcohol expectancies. Mean scores on the Positive Alcohol Expectancies subscale of the Comprehensive Effects of Alcohol Questionnaire were compared between NOW ( $n = 157$ ) and EOW ( $n = 47$ ). Levene's Test for Equality of Variances was conducted for this comparison ( $F(1, 202) = 0.816, p = 0.367$ ) and was not rejected. A mean difference ( $t = -0.365, p = 0.716$ ) in Positive Alcohol Expectancies between NOW ( $M = 3.21, SD = 0.71$ ) and EOW ( $M = 3.16, SD = 0.77$ ) was not identified.

#### **Exploratory Hypothesis 4: Mediation Analyses**

**Sample information.** In order to be included in this analysis, participants had to: 1) complete 80% or more of the full survey, 2) complete the items necessary for this analysis, 3) indicate that they had consumed an alcoholic beverage in the past year, and 4) be classified as NOW ( $n = 111$ ). The age of this sample ranged from 18 – 62 ( $M_{age} = 27.50, SD_{age} = 8.47$ ). The majority of this sample identified as bisexual ( $n = 77, 69.4\%$ ), and about one-fifth identified as pansexual ( $n = 22, 19.8\%$ ); participants also identified as heterosexual ( $n = 10, 9.0\%$ ), and queer ( $n = 2, 1.8\%$ ). Most of this sample identified as cisgender women ( $n = 105, 94.6\%$ ) and the majority identified their racial/ethnic identity as white ( $n = 102, 91.9\%$ ). The majority of participants indicated that they were currently in a romantic relationship ( $n = 78, 70.3\%$ ) and 18 (16.2%) reported that they considered themselves non-monogamous. About forty percent of the participants in this sample reported that they were currently attending college or university ( $n =$

43, 38.7%), and 55.0% (n = 61) of this sample indicated that they had earned a Bachelor's degree or higher. The majority of this sample indicated that their yearly household income was \$40,000 or less (n = 78, 70.3%), and the most often occurring yearly income range was "\$10,001-\$20,000" (n = 23, 20.7%). The majority of participants indicated that they are not in substance use recovery (n = 103; 92.8%). The majority of participants were recruited via the Womxn and LGBQ+ Facebook advertisement (n = 70, 63.1%).

**Results.** In order to determine the direct and indirect effects of binegative minority stressors (i.e., distal and proximal) and psychological processes (i.e., Positive Alcohol Expectancies, Drinking to Cope and Queer Social Support), two parallel mediation analyses were conducted using the PROCESS macro in SPSS (Hayes, 2013). As Distal and Proximal Binegative Minority Stressors were not correlated (*Pearson's*  $r = 0.058$ ,  $p = 0.487$ ), we proceeded as if they are independent variables, and perform separate mediation analyses. For each mediation analysis, demographics (i.e., age, college student status, relationship status, income, and racial identity [dichotomized into person of color or white]) and general minority stressors (i.e., Acceptance Concerns, Concealment, Internalized Homonegativity, and Heterosexist Experiences) were entered as covariates. Results were presented to represent the series of conceptual multiple regression analyses, in order to aid with interpretation of the results.

*Distal Binegative Minority Stress.* In the first mediation analysis, Distal Binegative Minority Stress was entered as the independent variable, with demographic and general minority stressors entered as covariates. First, these variables were regressed on Alcohol Use Disorder symptoms (Table 17). Next, three separate regression analyses were conducted regressing covariates and Distal Binegative Minority Stress onto each psychological process variable: Positive Alcohol Expectancies, Drinking to Cope, and Queer Social Support (Tables 18-20).



In the first regression of Distal Binegative Minority Stress predicting Alcohol Use Disorder symptoms, age was negatively related to Alcohol Use Disorder symptoms ( $\beta = -0.223$ ,  $t = -2.406$ ,  $p = 0.018$ ) and Distal Binegative Minority Stress was positively related to Alcohol Use Disorder symptoms ( $\beta = 0.319$ ,  $t = 3.369$ ,  $p = 0.001$ ). No other variables were related to Alcohol Use Disorder symptoms in this model. The variables in this model accounted for 27.14% of the variance in Alcohol Use Disorder symptoms ( $F(10, 100) = 4.321$ ,  $p < 0.001$ ).

**Table 17**

*Regression of Distal Binegative Minority Stress on Alcohol Use Disorder Symptoms*

<i>Dependent Variable = AUD</i>		<i>F (10, 100) = 4.321, p &lt; .001</i>		
<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.010	0.004	-2.406	0.018
Relationship Status	0.113	0.034	1.780	0.078
College Status	-0.023	0.068	-0.340	0.735
Income	0.003	0.010	0.283	0.778
Racial Identity	0.079	0.119	0.663	0.509
Acceptance Concerns	0.012	0.010	1.147	0.254
Concealment	-0.005	0.009	-0.545	0.587
Internalized Homonegativity	0.017	0.013	1.289	0.200
Heterosexist Experiences	-0.002	0.004	-0.450	0.654
<b>Independent Variable</b>				
Distal Binegative Minority Stress	0.012	0.004	3.369	0.001

In the regression of Distal Binegative Minority Stress predicting Positive Alcohol Expectancies, neither Distal Binegative Minority Stress, nor the covariates were related (Table 18), and the overall model did not account for variance in Positive Alcohol Expectancies ( $F(10, 100) = 1.499$ ,  $p = 0.148$ ). Internalized Homonegativity was positively related to Drinking to Cope ( $\beta = 0.285$ ,  $t = 2.742$ ,  $p = 0.007$ ), but neither covariates, nor Distal Binegative Minority Stress, were related to Drinking to Cope (Table 19). The overall model was not significant ( $F(10, 100) = 1.801$ ,  $p = 0.068$ ).

**Table 18***Regression of Distal Binegative Minority Stress on Positive Alcohol Expectancies (PAE)*

*Dependent Variable = PAE* *F* (10, 100) = 1.499, *p* = .1480

<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	0.084	0.312	0.2868	0.789
Relationship Status	-2.030	4.835	-0.420	0.068
College Status	11.161	5.196	2.148	0.034
Income	0.5245	0.759	0.691	0.491
Racial Identity	-10.996	9.064	-1.123	0.228
Acceptance Concerns	0.719	0.760	0.946	0.346
Concealment	0.857	0.659	1.300	0.197
Internalized Homonegativity	1.463	0.987	1.482	0.141
Heterosexist Experiences	0.194	0.271	0.717	0.475
<b>Independent Variable</b>				
Distal Binegative Minority Stress	-0.375	0.265	-1.416	0.160

**Table 19***Regression of Distal Binegative Minority Stress on Drinking to Cope (DC)*

*Dependent Variable = DC* *F* (10, 100) = 1.801, *p* = .068

<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.028	0.054	-0.039	0.667
Relationship Status	1.649	0.988	1.669	0.098
College Status	1.807	1.062	1.702	0.091
Income	-0.007	0.155	-0.045	0.964
Racial Identity	-1.260	1.852	-0.681	0.498
Acceptance Concerns	0.092	0.155	0.595	0.553
Concealment	-0.074	0.135	-0.552	0.582
Internalized Homonegativity	0.553	0.202	2.742	0.007
Heterosexist Experiences	0.045	0.055	0.805	0.422
<b>Independent Variable</b>				
Distal Binegative Minority Stress	-0.002	0.054	-0.039	0.969

In the regression of Distal Binegative Minority Stress predicting Queer Social Support (Table 20), only one covariate was related to the dependent variable. Age was negatively related to Queer Social Support ( $\beta = -.309$ ,  $t = -3.036$ ,  $p = 0.003$ ), but Distal Binegative Minority Stress was not related to Queer Social support ( $\beta = 0.012$ ,  $t = 0.449$ ,  $p = 0.654$ ). The model was not significant ( $F(10,100) = 1.691$ ,  $p = 0.091$ ) in explaining variance in Queer Social Support.

**Table 20***Regression of Distal Binegative Minority Stress on Queer Social Support (QSS)*

*Dependent Variable = QSS* *F* (10, 100) = 1.691, *p* = .091

<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.721	-0.238	-3.036	0.003
Relationship Status	0.990	3.681	0.269	0.789
College Status	-1.017	3.956	-0.257	0.798
Income	0.449	0.578	0.776	0.798
Racial Identity	0.038	6.900	0.006	0.996
Acceptance Concerns	0.469	0.579	0.811	0.410
Concealment	-0.831	0.502	-1.655	0.101
Internalized Homonegativity	-0.243	0.752	-0.323	0.747
Heterosexist Experiences	-0.239	0.206	-1.160	0.249
<b>Independent Variable</b>				
Distal Binegative Minority Stress	0.091	0.201	0.449	0.654

Mediation was not present as Distal Binegative Minority Stress was not related to

Positive Alcohol Expectancies, Drinking to Cope, or Queer Social Support. Positive Alcohol Expectancies, Drinking to Cope, and Queer Social Support were not indirectly related to Alcohol Use Disorder symptoms through their relationships with Distal Binegative Minority Stress. Therefore, the analysis was ended, and no further regression analyses were performed.

*Proximal Binegative Minority Stress.* In the second mediation analysis, Proximal Binegative Minority Stress was entered as the independent variable, with demographic and general minority stressors entered as covariates. First, predicting Alcohol Use Disorder symptoms (Table 21) and then predicting each psychological process variable: Positive Alcohol Expectancies, Drinking to Cope, and Queer Social Support, (Tables 22 - 25). In the final step of the analysis, covariates, Proximal Binegative Minority Stress, Positive Alcohol Expectancies, Drinking to Cope, and Queer Social Support were regressed on Alcohol Use Disorder symptoms, in or to assess for indirect effects (Table 26).

In the first step of the analysis, Proximal Binegative Minority Stress and covariates were regressed on Alcohol Use Disorder symptoms. Age was negatively related to Alcohol Use

Disorder symptoms ( $\beta = -.213, t = -2.224, p = 0.028$ ) and Acceptance Concerns was positively related to Alcohol Use Disorder symptoms ( $\beta = 0.255, t = 2.580, p = 0.011$ ). Proximal Binegative Minority Stress was negatively related to Alcohol Use Disorder symptoms ( $\beta = -0.210, t = -2.243, p = 0.027$ ), such that those reporting less Proximal Binegative Minority Stress reported more Alcohol Use Disorder symptoms, in accordance with the results from hypothesis two. The variables in the model accounted for 24.82% of the variance in Alcohol Use Disorder symptoms.

**Table 21**

*Regression of Proximal Binegative Minority Stress on Alcohol Use Disorder Symptoms (AUD)*

*Dependent Variable = AUD*

*F (10, 100) = 3.764, p < .001*

<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.009	0.004	-2.224	0.028
Relationship Status	0.061	0.065	0.936	0.352
College Status	0.020	0.070	0.291	0.772
Income	0.001	0.010	0.110	0.913
Racial Identity	-0.007	0.137	-0.047	0.962
Acceptance Concerns	0.026	0.010	2.580	0.011
Concealment	0.004	0.008	0.458	0.648
Internalized Homonegativity	0.028	0.014	1.984	0.049
Heterosexist Experiences	0.005	0.003	1.361	0.176
<b>Independent Variable</b>				
Proximal Binegative Minority Stress	-0.006	0.003	-2.243	0.027

Next, each psychological process variable and covariates were regressed on Alcohol Use Disorder symptoms. In the regression predicting Positive Alcohol Expectancies, Proximal Binegative Minority Stress was not a significant predictor ( $\beta = 0.044, t = 0.434, p = 0.666$ ). However, college student status was related, such that current college students were more likely to report more Positive Alcohol Expectancies than participants not currently in college ( $\beta = 0.228, t = 2.316, p = 0.022$ ). As Proximal Binegative Minority Stress does not relate to Positive

Alcohol Expectancies, Positive Alcohol Expectancies does not mediate or indirectly affect the relationship between Proximal Binegative Minority Stress and Alcohol Use Disorder symptoms (Table 22).

**Table 22**

*Regression of Proximal Binegative Minority Stress on Positive Alcohol Expectancies (PAE)*

<i>Dependent Variable = PAE</i>		<i>F (10, 100) = 1.519, p = 0.142</i>		
<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	0.068	0.308	0.221	0.825
Relationship Status	0.914	4.759	0.192	0.848
College Status	11.883	5.131	2.316	0.022
Income	0.768	0.753	1.019	0.310
Racial Identity	-13.974	10.011	-1.396	0.166
Acceptance Concerns	0.233	0.746	0.312	0.756
Concealment	0.865	0.625	1.384	0.169
Internalized Homonegativity	1.401	1.039	1.348	0.180
Heterosexist Experiences	0.105	0.244	0.431	0.668
<b>Independent Variable</b>				
Proximal Binegative Minority Stress	0.085	0.195	0.434	0.666

In the regression of covariates and Proximal Binegative Minority Stress predicting Drinking to Cope (Table 23), college student status was related to drinking to cope, such that current college students scored higher on Drinking to Cope more than participants not currently in college ( $\beta = 0.195, t = 2.085, p = .039$ ). Proximal Binegative Minority stress was positively related to Drinking to Cope ( $\beta = 0.228, t = 2.357, p = .020$ ), such that NOW who reported higher Proximal Binegative Minority Stress scored higher on Drinking to Cope. The variables in this model accounted for 20.11% of the variance in Drinking to Cope scores ( $F(10,100) = 2.870, p = 0.003$ ).

**Table 23***Regression of Proximal Binegative Minority Stress on Drinking to Cope*

*Dependent Variable = Drinking to Cope* *F* (10, 100) = 2.870, *p* = 0.003

<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.048	0.060	-0.799	0.426
Relationship Status	1.767	0.934	1.892	0.061
College Status	2.100	1.010	2.085	0.039
Income	0.088	0.148	0.596	0.553
Racial Identity	-0.906	1.965	-0.461	0.646
Acceptance Concerns	-0.004	0.146	-0.030	0.976
Concealment	-0.014	0.123	-0.115	0.909
Internalized Homonegativity	0.384	0.204	1.884	0.062
Heterosexist Experiences	0.057	0.048	1.181	0.240
<b>Independent Variable</b>				
Proximal Binegative Minority Stress	-0.090	0.038	-2.357	0.020

In the next regression, covariates and Proximal Binegative Minority Stress were regressed on Queer Social Support (Table 24). Age was negatively related to Queer Social Support, such that younger NOW reported more Queer Social Support ( $\beta = -0.287$ ,  $t = -2.981$ ,  $p < 0.001$ ). Proximal Binegative Minority stress was also negatively related to Queer Social Support ( $\beta = -0.345$ ,  $t = -3.594$ ,  $p = 0.001$ ), such that NOW who reported higher Proximal Binegative Minority Stress also reported less social support from queer people. The variables in this model accounted for 20.96% of the variance in Queer Social Support scores ( $F(10,100) = 3.02$ ,  $p = 0.002$ ).

**Table 24***Regression of Proximal Binegative Minority Stress on Queer Social Support*

<i>Dependent Variable = Queer Social Support</i>		<i>F (10, 100) = 3.023, p = 0.002</i>		
<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.649	0.222	-2.918	0.004
Relationship Status	0.929	3.439	0.270	0.788
College Status	1.369	3.71	0.369	0.713
Income	0.313	0.544	0.574	0.567
Racial Identity	-9.471	7.234	-1.309	0.193
Acceptance Concerns	0.946	0.539	1.755	0.082
Concealment	-0.518	0.451	-1.148	0.254
Internalized Homonegativity	0.922	0.751	1.228	0.222
Heterosexist Experiences	-0.118	0.177	-0.670	0.504
<b>Independent Variables</b>				
Proximal Binegative Minority Stress	-0.506	0.141	-3.594	0.001

In the final step of the mediation analysis, covariates, Proximal Binegative Minority Stress and each psychological process (i.e., Positive Alcohol Expectancies, Drinking to Cope, and Queer Social Support) were regressed on Alcohol Use Disorder symptoms, in order to determine the indirect effects of each psychological process on the relationship between Proximal Binegative Minority Stress and Alcohol Use Disorder symptoms (Table 25). The variables in this model accounted for 38.45% of the variance in Alcohol Use Disorder symptoms ( $F(13, 97) = 5.333, p < 0.001$ ). Acceptance Concerns was positively related to Alcohol Use Disorder symptoms ( $\beta = 0.227, t = 2.461, p = 0.015$ ), such that NOW who reported greater Acceptance Concerns reported higher Alcohol Use Disorder symptoms. Proximal Binegative Minority Stress was negatively related to Alcohol Use Disorder symptoms ( $\beta = -0.234, t = -2.561, p = 0.012$ ), such that NOW reporting less Proximal Binegative Minority Stress reported more Alcohol Use Disorder symptoms. Drinking to Cope ( $\beta = 0.424, t = 4.794, p < 0.001$ ), and Queer Social Support ( $\beta = 0.193, t = 2.233, p = 0.028$ ), were positively related to Alcohol Use Disorder symptoms. Interestingly, Queer Social Support was positively related to Alcohol Use

Disorder symptoms, such that NOW reporting more Queer Social Support also reported more Alcohol Use Disorder symptoms. NOW scoring higher on the Drinking to Cope measure reported higher Alcohol Use Disorder symptoms.

**Table 25**

*Regression of Proximal Binegative Minority Stress, Positive Alcohol Expectancies, Drinking to Cope, and Queer Social Support on Alcohol Use Disorder Symptoms*

<i>Dependent Variable = AUD</i>		<i>F (13, 97) = 5.333, p &lt; 0.001</i>		
<b>Covariates</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Age	-0.005	0.004	-1.319	0.190
Relationship Status	0.005	0.061	0.089	0.929
College Status	-0.026	0.067	-0.385	0.701
Income	-0.001	0.009	-0.130	0.897
Racial Identity	0.030	0.127	0.231	0.818
Acceptance Concerns	0.023	0.009	2.461	0.015
Concealment	0.008	0.008	0.998	0.320
Internalized Homonegativity	0.016	0.013	1.173	0.243
Heterosexist Experiences	0.004	0.003	1.124	0.263
<b>Independent Variables</b>				
Proximal Binegative Minority Stress	-0.007	0.003	2.764	0.007
<b>Mediating Variables</b>				
Positive Alcohol Expectancies	-0.002	0.001	-1.591	0.114
Drinking to Cope	0.030	0.006	4.784	<0.001
Queer Social Support	0.004	0.002	2.233	0.028

In order to determine the direct and indirect effects of each variable on Alcohol Use Disorder symptoms, standardized and unstandardized effects were tabulated using bootstrapped 95% confidence intervals (Table 26-27). The direct effect of Proximal Binegative Minority Stress on Alcohol Use Disorder symptoms and the corresponding confidence interval indicates partial mediation; that is, the negative relationship between Proximal Binegative Minority Stress and Alcohol Use Disorder symptoms is robust to the inclusion of mediator variables in the model (*Effect* = -0.0066, *t* = -2.561, *p* = 0.012 [95% CI = -0.012, -0.002]). Positive Alcohol Expectancies did not indirectly affect Alcohol Use Disorder symptoms (*Standardized Effect* = -



0.006, [95% CI = -0.035, 0.034]), as Positive Alcohol Expectancies and Proximal Binegative Minority Stress were not related. The indirect effect of Drinking to Cope was significant (*Standardized Effect* = 0.0970, [95% CI = 0.018, 0.200]), as was the indirect effect of Queer Social Support (*Standardized Effect* = -0.067, [95% CI = -0.143, -0.004]).

**Table 26**

*Effects of Proximal Binegative Minority Stress on Alcohol Use Disorder Symptoms*

	<b>Effect</b>	<b>SE</b>	<b>t</b>	<b>p</b>
Direct Effect	-0.007	0.003	-2.561	0.012
Total Effect	-0.006	0.003	-2.243	0.027

The total indirect effect of these variables was not significant (*Total Standardized Effect* = 0.024, [95% CI = -0.061, 0.138]). As the effect of Queer Social Support was negative and the effect of Drinking to Cope was positive, the summation of these effects (i.e., the total effect) may not best represent the effects of these variables in the model (i.e., they may act as “suppressor variables”). In order to conceptualize the total indirect effect of the significant mediators in the model, a specific indirect contrast was conducted (i.e., Standardized Effect of Drinking to Cope minus Queer Social Support). This contrast suggests that the Standardized Effect of these two variables explains 16.30% of the variance in Alcohol Use Disorder symptoms (*Standardized Effect (Contrast)* = 0.163, [95% CI = 0.048, 0.305]).

**Table 27**

*Standardized Indirect Effects of Psychological Processes*

<b>Variables</b>	<b>Effect</b>	<b>SE</b>	<b>(LLCI, ULCI)</b>
Standardized Total Indirect Effect	0.001	0.001	(-0.002, 0.004)
Positive Alcohol Expectancies	-0.001	0.001	(-0.001, 0.001)
Drinking to Cope (DC)	0.097	0.001	( 0.001, 0.006)
Queer Social Support (QSS)	-0.067	0.001	(-0.004, -0.001)
Specific Indirect Effect (DC minus QSS)	0.163	0.066	( 0.048, 0.305)

## Discussion

Minority Stress Theory emphasizes the distinctions between pathology, minority identities, and the direct and indirect stress processes that stem from living with a marginalized, stigmatized social identity. Epidemiological health disparities between sexual minority and heterosexual individuals support that unique minority stressors contribute to a larger cumulative stress load, which in turn explains poorer health outcomes among sexual minority individuals. Minority Stress Theory represents an essential model for conceptualizing the experiences of sexual minority individuals, without continuing a legacy of stigmatization and pathologization of sexual minority people. However, the key components of the Minority Stress Model have not been studied uniformly across all sexual minority groups; in particular, the experiences of SM women, non-exclusively oriented people, and gender diverse individuals are underrepresented in the literature. The extension of this model, the Psychological Mediation Framework (PMF), continues to provide theory that alleviates stigma, and conceptualizes psychological processes relevant in the prevention and treatment of minority stress related concerns. However, similar to the Minority Stress Theory, the PMF does not necessarily account for unique barriers or concerns experienced by non-exclusively oriented people, or of womxn. Integrating those unique concerns, addressed by Ochs's (2008) Theory of Binegativity, into the extended Minority Stress Framework, allows for a more representative model of understanding the processes through which minority stress as a construct, including binegative stressors, precipitate disproportionate rates of health concerns. Comprehensive evaluation of minority stress including stressors unique to NOW and the processes by which minority stress confers health concerns aids in the development of prevention and treatment of the disproportionately elevated rates of alcohol use disorder among non-exclusively oriented individuals.

The development of bisexual-specific minority stress measures, and research demonstrating alcohol use concerns among NOW, give rationale and tools to study and address these concerns with empirical work. Integration of multiple models, and testing those models provides a more representative framework for explaining the relationship between minority stress, and the processes by which minority stress may lead to health disparities, such also alcohol misuse. Further, an integrated approach allows for the testing of targets for prevention and intervention among this at-risk, underrepresented population. This study integrates multiple theories aimed at explaining health disparities among NOW, and develops the current understanding of the relationships between general minority stressors, binegative minority stressors, psychological processes, and alcohol use disorder. Importantly, these results suggest a process by which the experiences of minority stress engenders health concerns, specifically alcohol use disorder symptoms. This process deserves further study with temporal and experimental designs in order to best evaluate causal relationships between minority stress, psychological processes, and alcohol misuse. Identification of psychosocial factors within this process is useful for the development of prevention and treatment interventions to disrupt these processes, and improve the well-being of NOW.

NOW experience general minority stress, and unique binegative stress. Therefore, both kinds of experiences are key to evaluate in order to best reflect the experiences of NOW, and to explain disproportionate rates of AUD. In order to best address general minority stressors and binegative minority stressors, both their overlapping and distinct elements should be examined. Results from this study indicate that NOW experience a higher cumulative stress load than EOW. Unsurprisingly, NOW reported higher distal binegative stressors than EOW. However, general minority stressors are not irrelevant to NOW; results indicated that NOW reported higher

acceptance concerns and concealment than EOW. EOW reported more experiences of heterosexist discrimination, harassment, and prejudice than NOW. This result deserves further study, as several contextual variables related to visibility (i.e., current and historical perceived partner genders, gender presentation/perceived gender, outness, geographic location) might provide more insight into the nature of this finding.

Interestingly, NOW and EOW did not differ in their reported proximal binegative minority stress. This result should be interpreted with caution, as the proximal binegative minority stress measure demonstrated a restriction in range. As discussed in the results section, this author has several hypotheses attempting to address the measurement concerns of proximal binegative minority stress, and alternate explanations, which warrant further study and might explain this null finding. First, all items in the Bisexual Identity Inventory refer to bisexuality or a bisexual identity; in order to address this concern while maintaining the validity of the measure, this author included instructions explaining the wording of the items, and indicating that “bisexual” and “bisexuality” were used to refer to many non-exclusive identities (e.g., pansexual, sexually-fluid). Understandably, NOW who did not claim a bisexual identity, may have responded in a way indicating that those items did not apply to them. In order to test this hypothesis, a supplemental analysis was conducted (See Appendix F for results). Differences in Proximal Binegative Minority Stress were not identified between sexual identities among NOW.

Another explanation for these null findings relates to the construct validity of the Bisexual Identity Inventory total score, which reflects the Illegitimacy of Bisexuality subscale. This subscale reflects beliefs about non-exclusive orientation and might tap biphobia, or biphobic beliefs, which may be directed inwards towards the self, or towards others in the form of discrimination or prejudice. Importantly, the items on this subscale are not self-referential

(i.e., “I am not a real person because I am bisexual”), but reflect broad beliefs (i.e., “Bisexuality is not a real identity.”) Therefore, score on this subscale may reflect biphobia for exclusively-oriented people, and internalizations of biphobia for non-exclusively oriented people. In order to test this hypothesis, a supplemental, exploratory analysis was conducted. Mean differences (via an independent samples t-test) between NOW and EOW on the summed score of Illegitimacy of Bisexuality subscale were identified. This supplemental analysis (see Appendix F) identified that EOW endorsed higher scores on the Illegitimacy of Bisexuality subscale than NOW.

Therefore, one potential reason for this null finding might lie in the how the Bisexual Identity Inventory samples both broad biphobia beliefs and self-directed biphobic beliefs. This supplemental result suggests that EOW may have scored similarly to NOW on the full-scale Bisexual Identity Inventory, due to EOW endorsing higher biphobic beliefs on the Illegitimacy of Bisexuality subscale. However, the results of this study suggest that NOW experience a higher cumulative stress load than EOW, although differences in specific minority stressors are still relevant to each group. Despite the surprising nature of these results, they indicate that NOW experience unique stressors, and cumulatively more minority stress than EOW.

In continuation of integration and support of a model that explains the unique experiences of NOW, both general minority stressors and binegative stressors accounted for variation in alcohol use disorder symptoms. Of the general minority stressors, higher endorsement of sexual identity concealment predicted higher alcohol use disorder symptoms. Distal binegative stress was positively related to higher alcohol use disorder symptoms, and accounted for a unique, additional proportion of variance in alcohol use disorder symptoms over and above general minority stressors. Despite measurement concerns with the Bisexual Identity Inventory, and null

findings of group differences between NOW and EOW, these results indicate that proximal binegative stress is related to alcohol use disorder symptoms.

However, the negative relationships between proximal binegative minority stress, acceptance concerns, and alcohol use disorder remains surprising to this author, and warrants further investigation. Explanations for these relationships are provided within the context of the mediation model results. Importantly, both distal and proximal binegative stressors were related to alcohol use disorder symptoms over and above demographic variables, and general minority stressors. These findings continue to garner support that both general minority stressors, particularly acceptance concerns and concealment, as well as binegative minority stressors, are relevant constructs to consider in explaining alcohol use disorder symptoms among NOW.

Results comparing psychological processes (positive alcohol expectancies, drinking to cope, and queer social support) between NOW and EOW expand upon the original minority stress model to include the extended Psychological Mediation Framework. Additionally, the series of mean comparisons aimed to test the theory of binegativity, which suggests that non-exclusively oriented people experience exclusion from queer spaces, and therefore may have different coping resources. Results from this series of analyses are mixed. EOW and NOW endorsed similar levels of positive alcohol expectancies and similar levels of queer social support. Yet, NOW endorsed drinking to cope more than EOW. These results suggest that NOW may use alcohol as a coping strategy more than EOW, perhaps in order to manage a larger cumulative minority stress load. These results support a key element of minority stress informed research: identities themselves do not precipitate poorer health, but rather the process of managing or coping with the additional stressors from having a stigmatized identity do. Interpreting these null findings from a minority stress-informed lens offers insight into the

limited conclusions of these results. The theory of binegativity suggests that non-exclusively oriented people are excluded from or have limited access to both non-queer and queer social supports. This study did not examine differences between NOW and EOW in terms of their non-queer social support, nor the relationship between binegative minority stressors and social support. In keeping with an affirming, minority stress-informed perspective, identity alone does not confer poorer outcomes; experiences of minority stress necessitate coping through psychological processes, which precipitates worse health outcomes. Therefore, mean comparisons of these psychological processes based on identity *alone* should not yield meaningful results. However, more experiences of relevant minority stressors should, according to the extended minority stress model, negatively relate to psychological processes, such as social support.

Dunham, Davis, Bowlen, Brennan, Ji & Cochran (*under review*, 2020) examined the relationship between binegative minority stressors, queer social support, and non-queer social support in the same sample of NOW. Results from that study indicated that distal binegative minority stress was negatively related to instrumental queer social support, yet positively related to affective non-queer social support. Further, the authors found that proximal binegative minority stress was negatively related to both instrumental and affective queer support, as well as negatively related to affective non-queer social support. Binegative minority stressors were neither related to tangible support nor positive social interactions from queer or non-queer social supports. Dunham and colleagues (*under review*, 2020) suggest that experiences of binegative minority stress might limit how authentically and expressive NOW engage in relationships, which may lead to less intimate or supportive social connections. Having limited or constrained relationships may limit and constrain NOW's resources for coping with prejudice and stigma.

The null findings surrounding tangible and positive social interactions suggest that NOW may *access* social support, but may not use those relationships for affective and instrumental support. Further, and surprisingly, distal binegative minority stress was positively associated with affective non-queer social support. This may indicate that experiences of bi-negativity within queer spaces result in NOW turning to non-queer social support as a result of erasure and ostracization within queer communities. Contextualizing the results of this study within other findings, despite the null findings, suggests support for the extended minority stress model, and a minority-stress informed understanding of the theory of binegativity.

Support for integration of the theory of binegativity within the extended minority stress theory is mixed. Distal binegative minority stress was not related to positive alcohol expectancies, drinking to cope, or queer social support. Proximal binegative minority stress was also not related to positive alcohol expectancies. However, drinking to cope and queer social support indirectly affected the relationship between proximal binegative minority stress and alcohol use disorder symptoms. Higher endorsement of proximal binegative minority stress was related to higher endorsement of drinking to cope, which was related to higher alcohol use disorder symptoms. The direction of the relationships between proximal binegative minority stress, acceptance concerns, and alcohol use disorder symptoms is surprising and unexpected to this author; yet might be explained by the relationships between proximal binegative minority stress, acceptance concerns, and queer social support.

Proximal binegative minority stress was negatively related to queer social support, such that NOW reporting higher proximal binegative minority stress reported less queer social support. Queer social support was positively related to alcohol use disorder symptoms, such that NOW reporting more queer social support reported higher alcohol use disorder symptoms.



Therefore, the indirect effect of queer social support may partially explain the negative relationship between proximal minority stress and alcohol use disorder symptoms. NOW who endorsed more proximal binegative minority stress endorsed less queer social support, and also fewer alcohol use disorder symptoms. However, the direct negative effect of proximal binegative minority stress remained a significant predictor of alcohol use disorder symptoms when controlling for the variance explained by queer social support.

Proximal binegative minority stress and acceptance concerns were positively correlated among NOW. However, the relationship between each of these variables and alcohol use disorder symptoms demonstrated different directions: proximal binegative minority stress was *negatively* related to alcohol use disorder symptoms and acceptance concerns was *positively* related to alcohol use disorder symptoms. The indirect effects of psychological processes may explain why the directions of these relationships are opposing. While proximal binegative minority stress was positively associated with drinking to cope and queer social support, acceptance concerns were unrelated to those psychological processes. Both proximal binegative minority stress and acceptance concerns remained robust predictors of alcohol use disorder symptoms with the inclusion of psychological processes and general minority stressors in the model. Therefore, acceptance concerns, or fearing rejection from others on the basis of one's sexual identity, may represent another important treatment target among NOW with disordered alcohol use symptoms.

Altogether, this study address gaps in minority stress literature, especially those pertaining to NOW. Congruent with the extended minority stress framework, non-exclusively oriented womxn reported a higher cumulative minority stress load, as well as higher specific minority stressors, than exclusively oriented womxn. Both general and binegative minority

stressors explained unique proportions of variance in alcohol use disorders, emphasizing the importance of measuring minority stress using holistic approaches for non-exclusively oriented individuals, particularly womxn. In alignment with a minority stress-informed perspective of the theory of binegativity, sexual orientation alone did not confer differences in general psychological processes. Proximal binegative minority stress, included alongside general minority stressors within the extended minority stress framework, related to psychological processes. Indirect effects of queer social support and drinking alcohol to cope, and the direct effect of proximal binegative minority stress, accounted for variation in alcohol use disorder symptoms among NOW.

### **Limitations**

This study has several limitations. Diamond & Savin-Williams (2009) have documented several common sampling biases in sexual minority research, including self-selection biases and a tendency for sexual minority survey respondents to be younger and well-educated. Individuals who are more open about their sexuality are more likely to self-select to participate in sexual minority-related studies. Despite attempts to address sampling concerns utilizing unique methodology, the majority of the sample was recruited using non-blinded materials, and therefore, is subject to this sampling bias. Although this study included trans women, the small sample of trans women limits conclusions drawn about that unique group. Notably, this study did not utilize an intersectional approach which would have incorporated the unique and overlapping experiences of gender minority related stress. Therefore, the contribution of gender minority stress is not represented and is not known. The sample in this study is well-educated, and is negatively skewed in terms of age, such that the majority of participants were college educated and young adults. Sampling biases due to racial background are also common in sexual

minority research (Calzo, Antonucci, Mays, & Cochran, 2011), leading to over-representing white sexual minority individuals. Any of these demographic variables could skew the distributions of the variables of interest, and bias the overall findings.

Importantly, this study is cross-sectional, and the results are correlational. As such, temporal or causal inferences/conclusions should not be drawn, particularly for regression-based analyses. This study also relied on retrospective self-report, and therefore the accuracy of the responses may be compromised due to the limitations of recalling past events. Items that query sensitive or personal information (e.g., experiences of discrimination, alcohol use) are more likely to be skipped, which may lead to participants dropping out to the survey, or skipping items. For data regarding alcohol use, noticeable levels of missing data were detected. Due to the nonrandom sampling technique, the design, the sample represented, and the analyses conducted, generalizability is limited. As mxn and gender diverse individuals were not included in the analyses, the results should not be generalized to these groups. Generalization to older adults, people of color, and less educated individuals is also limited.

### **Future Directions**

Binegative minority stress is often overlooked, or is the sole focus of research aimed at non-exclusively oriented people. Future research should aim to improve and include all relevant minority stressors, especially for this population. As sexual identity categories continue to expand, measures must be updated and modified to affirm diverse peoples' experiences and identities. Similarly, researchers might evaluate the construct validity of minority stress measures, as the nature of discrimination, prejudice and stigma shifts with social norms and expectations. Subtler forms of distal and proximal stressors might not be captured with the

current tools. In addition to including relevant minority stress measures, future work might benefit from extending upon the motivations for alcohol use, such as drinking to enhance experiences and drinking to reduce tension. Understanding the diverse motivations for alcohol use may better explain alcohol use disparities among non-exclusively oriented womxn, and help in developing prevention and intervention tactics for health providers and health systems.

Non-exclusively oriented womxn report higher rates of other health concerns, including cannabis use disorder, depression disorders, and suicidality. It would be worthwhile for future work to examine the relationships between cumulative sexual minority stress, psychological processes (such as social support and emotion regulation), and those health outcomes. Broadening the tools used to measure emotion regulation, and the specific functions of social support, appear rich areas for further exploration. In particular, the relationship between minority stress and social support remains complicated. In order to continue integrating the theory of binegativity and minority stress theory, further work might explore discrimination toward non-exclusively oriented individuals within queer spaces or perpetuated by queer people. Given the results of this work, future work might expand to include non-exclusively oriented mxn, and gender diverse individuals. However, such research should consider utilizing measures to capture the unique experiences of sexism, cisgenderism, as well as minority stress related to sexuality.

To address alcohol use disorder disparities, as well as other health disparities, among non-exclusively oriented womxn, more research is needed. Integrating the theory of binegativity into the extended minority stress framework provides several points for prevention and intervention. As minority stress processes are necessarily interpersonal and intrapersonal, both broad, systemic prevention strategies and interpersonal interventions are important to consider in

efforts to improve the well-being of all sexual minority individuals, including non-exclusively oriented womxn.

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## **Appendices**

### **Appendix A**

#### Recruitment Materials

##### ***Recruitment Scripts for Facebook and Reddit***

**Blinded Recruitment Materials.** For Facebook and reddit, this author and their research assistants contacted moderators and administrators for approval and to answer questions regarding the project. The messages sent to page administrators and moderators followed the script below:

*“Hi there! I am a health researcher at the University of Montana, and I am looking for individuals to participate in a research study about the relationship between stress and*

*health for women and gender diverse people. Would you mind if I posted a link to the study to your group?"*

After answering questions and receiving approval from page administrators and moderators, the following script was posted to the page in question, with participation links matching the sampling target:

*"Hi there! I am a LGBTQ+ health researcher at the University of Montana, looking for individuals to participate in a research study to improve our current understanding of their valuable life experiences! In particular, we are interested to know more about how specific kinds of stressors relate to health among women and gender diverse people.*

*We need participants who are at least 18 years old, identify as women or gender diverse (regardless of sex assigned at birth) and reside in the United States. As part of your participation, you will be asked to fill out an anonymous, online questionnaire (INSERT LINK) to tell us about your experiences.*

*The first part of the survey includes a brief (i.e., 3 minute) screener to determine whether you are eligible to complete the full survey. The survey should take between 60-75 minutes to complete. Your participation is completely voluntary, and you can leave the survey at any time.*

*Those accessing the survey will have the chance to enter a drawing to win one of 5 \$30 gift cards to Amazon.com!*

*I appreciate and value any and all feedback about this survey, in order to improve my future projects! Please direct comments and questions to [kinsie.dunham@umontana.edu](mailto:kinsie.dunham@umontana.edu).*

*Thanks so much!"*

On reddit, posts were made with the title and descriptions below:

*[Academic] Health and Stress Study Participation Request*

**Targeted Sampling Scripts.** Targeted recruitment materials were approval via an IRB addendum, which included identifying that the study focused on LGBTQ+ individuals. The Facebook and Reddit message and post scripts are below:

*"Hi there! I am a LGBTQ+ health researcher at the University of Montana, and I am looking for individuals to participate in a research study about the relationship between stress and health for women and gender diverse people. Would you mind if I posted a link to the study to your group?"*

Post Scripts:

*"Hi there! I am a LGBTQ+ health researcher at the University of Montana, looking for individuals to participate in a research study to improve our current understanding of their valuable life experiences! In particular, we are interested to know more about how specific kinds of stressors relate to health among women and gender diverse people.*

*We need participants who are at least 18 years old, identify as women or gender diverse (regardless of sex assigned at birth) and reside in the United States. As part of your participation, you will be asked to fill out an anonymous, online questionnaire (INSERT LINK) to tell us about your experiences.*

*The first part of the survey includes a brief (i.e., 3 minute) screener to determine whether you are eligible to complete the full survey. The survey should take between 60-75*

*minutes to complete. Your participation is completely voluntary, and you can leave the survey at any time.*

*Those accessing the survey will have the chance to enter a drawing to win one of 5 \$30 gift cards to Amazon.com!*

*I appreciate and value any and all feedback about this survey, in order to improve my future projects! Please direct comments and questions to [kinsie.dunham@umontana.edu](mailto:kinsie.dunham@umontana.edu).*

*Thanks so much!"*

## **Appendix B**

### Targeted Sample Flyer

The below flyer was used to recruit participants on Facebook, reddit, Twitter, and Instagram.

## LGBTQ+ Health Research Opportunity

### Opportunity to share your experiences!

We are group of **LGBTQ+ health** researchers at the University of Montana, looking for individuals to participate in a research study to improve our current understanding of their valuable life experiences! In particular, we are interested to know more about how specific kinds of stress relate to health among women and gender diverse people.

#### We are looking for participants who:

Are t least 18 years old,  
Identify as women or gender diverse (*regardless of sex assigned at birth*), and  
Reside in the United States

As part of your participation, you will be asked to fill out an anonymous, online questionnaire to tell us about your experiences. The first part of the survey includes a brief (i.e., 3 minute) screener to determine whether you are eligible to complete the full survey. The full survey should take between 60-75 minutes to complete. **Your participation is completely voluntary, and you can leave the survey at any time!** Those accessing the survey will have the chance to enter a drawing to **win one of 5 \$30 gift cards to Amazon.com!**

#### **PARTICIPATE HERE:**

[https://umt.co1.qualtrics.com/jfe/form/SV\\_ctF7tMZ9CNIGn1](https://umt.co1.qualtrics.com/jfe/form/SV_ctF7tMZ9CNIGn1)

#### **Please direct comments and questions to:**

[kinsie.dunham@umontana.edu](mailto:kinsie.dunham@umontana.edu)





## Appendix C

## Demographic Information Stratified by Sampling Target.

Table A1

*Gender Identity and Sex Assigned at Birth by Sampling Target*

	Cis Women	Trans Women	Non-Binary	Something Else	Assigned Female at Birth
<b>General FB</b>	70 (98.6%)	0 (0.0%)	1 (1.4%)	0 (0.0%)	69 (97.2%)
<b>General Link</b>	35 (71.4%)	5 (10.2%)	7 (14.3%)	2 (4.1%)	36 (85.4%)
<b>Womxn</b>	23 (88.5%)	1 (3.8%)	2 (7.6%)	0 (0.0%)	26 (100.0%)
<b>LGBTQ+</b>	32 (51.6%)	4 (6.3%)	27 (29.0%)	8 (12.9%)	50 (83.3%)
<b>Womxn &amp; LGBTQ+</b>	38 (86.4%)	1 (2.3%)	5 (11.3%)	0 (0.0%)	41 (93.2%)
<b>LGBTQ+ FB</b>	246 (79.9%)	12 (3.9%)	38 (12.4%)	12 (3.9%)	276 (94.5%)
<b>Total</b>	444 (79.3%)	23 (4.1%)	80 (14.3%)	22 (3.9%)	497 (88.8%)

Table A2

*Sexual Identity by Sampling Target*

	Gay	Lesbian	Bisexual	Pansexual	Asexual	Heterosexual	Something Else
<b>General</b>	2 (2.8%)	6 (8.5%)	25 (35.2%)	4 (5.6%)	9 (12.7%)	23 (32.4%)	2 (2.8%)
<b>General FB</b>	2 (4.1%)	7 (14.3%)	21 (42.9%)	9 (18.4%)	4 (8.2%)	5 (10.2%)	1 (2.0%)
<b>Womxn</b>	0 (0%)	1 (3.8%)	12 (46.2%)	5 (19.2%)	0 (0%)	7 (26.9%)	1 (3.8%)
<b>LGBTQ+</b>	2 (3.2%)	14 (22.6%)	12 (19.4%)	19 (30.6%)	7 (11.3%)	1 (1.6%)	7 (11.3%)
<b>Womxn &amp; LGBTQ+</b>	2 (4.5%)	18 (40.9%)	17 (38.6%)	3 (6.8%)	2 (4.5%)	2 (4.5%)	0 (0%)
<b>LGBTQ+ FB</b>	6 (1.9%)	59 (19.2%)	141 (45.8%)	55 (17.9%)	23 (7.5%)	11 (3.6%)	13 (4.2%)
<b>Total</b>	14 (2.5%)	105 (18.8%)	228 (40.7%)	95 (17.0%)	45 (8.0%)	49 (8.8%)	24 (4.3%)

Table A3

*Current and Past Relationships and Non-monogamy by Sampling Target*

	Same-Gender Sexual Behavior	Same-Gender Attraction	Current Relationship	Non-monogamous
<b>General</b>	48 (67.6%)	54 (76.1%)	43 (60.6%)	13 (18.3%)
<b>General FB</b>	23 (46.9%)	39 (79.6%)	27 (55.1%)	10 (24.0%)
<b>Womxn</b>	18 (69.2%)	24 (92.3%)	18 (72.0%)	3 (12.0%)
<b>LGBTQ+</b>	50 (80.6%)	60 (96.8%)	36 (60.0%)	26 (32.0%)
<b>Womxn &amp; LGBTQ+</b>	35 (79.5%)	42 (95.5%)	30 (68.2%)	8 (18.1%)
<b>LGBTQ+ FB</b>	206 (66.9%)	289 (93.8%)	163 (55.8%)	80 (26.0%)
<b>Total</b>	380 (67.9%)	508 (90.7%)	317 (56.6%)	140 (25.0%)

**Table A4***Age Distributions by Sampling Target*

	Age (M, SD)	Median	Minimum Age	Maximum Age
<b>General FB</b>	38.28, 14.50	33.5	18.0	73.0
<b>General Link</b>	28.88, 10.47	26.0	19.0	73.0
<b>Womxn</b>	31.72, 9.74	28.0	21.0	56.0
<b>LGBTQ+</b>	29.20, 8.65	28.0	18.0	61.0
<b>Womxn &amp; LGBTQ+</b>	30.38, 10.41	29.5	19.0	58.0
<b>LGBTQ+ FB</b>	24.54, 6.45	23.0	18.0	66.0
<b>Total</b>	27.98, 10.03	25.0	18.0	73.0

**Table A5***Racial Identity by Sampling Target*

	White	African American/ Black	Latinx	Asian Pacific Islander	Native American/ American Indian	Middle Eastern	Multiracial
<b>General FB</b>	28 (66.7%)	0 (0%)	2 (4.8%)	2 (4.8%)	0 (0.0%)	0 (0.0%)	7 (14.3%)
<b>General Link</b>	53 (80.3%)	6 (9.1%)	2 (3.0%)	3 (4.5%)	0 (0.0%)	0 (0.0%)	5 (7.0%)
<b>Womxn</b>	23 (92.0%)	1 (4.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (3.8%)
<b>LGBTQ+</b>	47 (87.0%)	0 (0.0%)	2 (3.7%)	1 (1.9%)	2 (3.7%)	0 (0.0%)	8 (12.9%)
<b>Womxn &amp; LGBTQ+</b>	29 (65.9%)	2 (4.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	12 (27.3%)
<b>LGBTQ+ FB</b>	228 (72.4%)	6 (1.9%)	6 (1.9%)	6 (1.9%)	0 (0.0%)	1 (0.32%)	45 (14.6%)
<b>Total</b>	408 (72.9%)	15 (2.7%)	12 (2.1%)	12 (2.1%)	2 (0.36%)	1 (0.18%)	78 (13.9%)

**Table A6***Highest Education Earned by Sampling Target*

	High School	Some College	Associates	Bachelor's	Master's	Doctoral	Something Else
<b>General FB</b>	6 (8.7%)	20 (29.0%)	10 (14.5%)	18 (26.1%)	13 (18.8%)	1 (1.4%)	1 (1.4%)
<b>General</b>	2 (5.0%)	12 (30.0%)	1 (2.5%)	17 (42.5%)	7 (17.5%)	1 (2.5%)	0 (0%)
<b>Womxn</b>	1 (4.0%)	6 (24.0%)	0 (0%)	10 (40.0%)	4 (16.0%)	3 (12.0%)	1 (4.0%)
<b>LGBTQ+</b>	5 (8.3%)	14 (23.3%)	5 (7.8%)	19 (31.7%)	11 (17.7%)	4 (6.7%)	2 (3.3%)
<b>Womxn &amp; LGBTQ+</b>	3 (7.0%)	14 (32.6%)	3 (7.0%)	14 (32.6%)	5 (11.6%)	4 (9.3%)	0 (0%)
<b>LGBTQ+ FB</b>	30 (10.3%)	115 (39.4%)	14 (4.8%)	101 (34.6%)	24 (8.2%)	3 (1.0%)	5 (1.7%)
<b>Total</b>	43 (7.7%)	181 (32.3%)	33 (5.9%)	179 (32.0%)	64 (11.4%)	16 (2.9%)	9 (1.6%)

**Table A7***Median Income Range by Sampling Target*

	<b>Median Income Range</b>
<b>General FB</b>	\$30,001- 40,000
<b>General Link</b>	\$40,001-50,000
<b>Womxn</b>	\$50,001-60,000
<b>LGBTQ+</b>	\$30,001- 40,000
<b>Womxn &amp; LGBTQ+</b>	\$30,001- 40,000
<b>LGBTQ+ FB</b>	\$30,001- 40,000
<b>Total</b>	\$40,001-50,000

**Table A8***Current College Students by Sampling Target*

	<b>Current College Students</b>
<b>General FB</b>	14 (20.6%)
<b>General Link</b>	18 (45.0%)
<b>Womxn</b>	9 (36.0%)
<b>LGBTQ+</b>	23 (38.3%)
<b>Womxn &amp; LGBTQ+</b>	14 (32.6%)
<b>LGBTQ+ FB</b>	144 (49.3%)
<b>Total</b>	222 (39.6%)

## Appendix D

### MANOVA Assumptions Testing

#### Normality Assumptions

Univariate, bivariate, and multivariate normality assumptions for a multivariate analysis of variance (MANOVA) were tested using a variety of graphical and non-graphical means (e.g., visual inspection of univariate and bivariate distributions, quartile-quartile (Q-Q) plots, skewness and kurtosis statistics, and normality statistics). The Shapiro-Wilk statistics and associated probabilities for all four measures of general minority stress, Acceptance Concerns ( $p < 0.001$ ), Concealment ( $p < 0.001$ ), Internalized Homonegativity ( $p < 0.001$ ), and Heterosexist Experiences ( $p < .001$ ), provided evidence to reject the null hypothesis, suggesting the variables are not normally distributed. The Shapiro-Wilk statistics and associated probabilities for variables of Distal Binegative Minority Stress ( $p = .103$ ) and Proximal Binegative Minority Stress ( $p = .205$ ) did not provide evidence to reject the null hypothesis that the distributions are not normally distributed. Skewness statistics for each general minority stress measure fell beyond three standard errors of the statistic, suggesting these variables are not symmetrical. Similarly, the kurtosis statistics for each general minority stress variable fell beyond three standard errors of the statistic. Skewness and kurtosis statistics for Distal Binegative Minority Stress and Proximal Binegative Minority Stress suggest that these distributions are not positively or negatively skewed, and are not leptokurtic or platykurtic.

Visual inspection of Q-Q plots for Internalized Homonegativity and Heterosexist Experiences suggest that the deviations from normality are not equally distributed about the variable, but are larger at the lower and upper bounds of the measure. For Internalized

Homonegativity, deviations from normality range from -0.5 to 1.5, and for Heterosexist Experiences, they range from -0.5 to 1.0. Visual inspection of the Q-Q plot for Acceptance Concerns suggests that the deviations from normality are relatively equally distributed across the variable, and range from -0.2 to 0.1. However, inspection of the Q-Q plot for Concealment Motivations suggests that errors are not equally distributed across the variable (ranging from -0.4 to 0.2), and are larger at the lower and upper ends. Deviations from normality for Distal Binegative Minority Stress appear evenly dispersed, although deviations appear larger along the upper and lower ends of the variable. Deviations for Distal Binegative Minority Stress range from -0.2 to 0.4. The dispersion of deviations from normality for Proximal Binegative Minority Stress appears evenly distributed, save for one deviation at the uppermost end of the variable.

Bivariate normality for each combination of the six dependent variables was assessed by visual inspection of bivariate distributions. As expected due to their skewness, bivariate combinations with Internalized Homonegativity and Heterosexist Experiences did not appear normally distributed. All other combinations of dependent variables appeared relatively normal. Due to a lack of univariate and bivariate normality across Internalized Homonegativity and Heterosexist Experiences, and their bivariate combinations with other dependent variables, multivariate normality is not assumed. In order to identify extreme cases, Mahalanobis' distances were evaluated against the critical value ( $df = 6$ ,  $critical\ value = 22.46$ ). No cases were identified as outliers by this procedure. Although normality assumptions are not met, we will proceed with planned analyses, and interpret with caution.

### **Multicollinearity Assumption**

To assess for multicollinearity between dependent variables, zero-order correlations were conducted between each combination of the six dependent variables. Zero-order correlation

coefficients suggest that the dependent variables covary, but not so much that they are multicollinear ( $r > .80$ ).

**Table A9**

*Zero Order Correlations between General and Binegative Minority Stress Variables*

	1	2	3	4	5	6
1. Acceptance Concerns	1.000					
2. Concealment Motivation	0.397**	1.000				
3. Internalized Homonegativity	0.317**	0.324**	1.000			
4. Distal General Minority Stress	0.210**	-0.043	0.071	1.000		
5. Distal Binegative Minority Stress	0.432**	0.309**	-0.016	0.301**	1.000	
6. Proximal Binegative Minority Stress	0.161*	0.308**	0.416**	0.058	0.129	1.000

\*=  $p < 0.05$ , \*\* =  $p < 0.01$

**Assumption of Equality of Variances and Homogeneity of Covariance Matrices**

In order to test the assumption of homogeneity of covariance matrices, and account for unequal cell sizes, Box's Test of Equality of Covariance Matrices was conducted (*Box's M* = 52.388,  $p = 0.002$ ). The null hypothesis of equality of covariance matrices was not rejected, meaning there is no evidence that the covariance matrices are unequal. To test for equality of variances across NOW and EOW, Levene's test was conducted for each of the dependent variables. The probabilities of Levene's statistic were above 0.05 for the following variables: Internalized Homonegativity, Acceptance Concerns, Concealment, and Distal Binegative Minority Stress. However, variances are not assumed to be equal between NOW and EOW for Heterosexist Experiences (*Levene's Statistic* = 4.622,  $p = 0.033$ ) and Proximal Binegative Minority Stress (*Levene's Statistic* = 17.688,  $p < 0.001$ ). Although the equality of variances between NOW and EOW cannot be assumed for Heterosexist Experiences and Proximal

Binegative Minority Stress, we will proceed with the planned analyses, and interpret with caution.

## Appendix E

### Hierarchical Regression Assumption Testing

#### Linearity Assumption

In order to assess the assumption that each independent variable has a linear relationship with the dependent variable, simple scatterplots were created for each combination of the independent and dependent variable and visually inspected. Each combination appeared to demonstrate a linear relationship.

#### Normality Assumptions

Univariate and bivariate normality for minority stress and binegative minority stress variables are outlined in a previous section. In order to assess the univariate normality of alcohol use disorder (AUD) graphical and non-graphical tests were conducted. The Shapiro-Wilk statistic and associated probability indicated that normality should not be assumed (*Statistic* = 0.862,  $p < .001$ ). The skewness statistic for AUD (*Statistic* = -1.162,  $SE = 0.185$ ) fell beyond three standard errors of the statistic, suggesting the distribution of AUD scores is negatively skewed. The kurtosis statistic for AUD variable fell within three standard errors of the statistic (*Statistic* = 0.629,  $SE = 0.367$ ) indicated that the distribution is not leptokurtic or platykurtic. Visual inspection Q-Q plots and histograms of the AUD variable support that AUD scores are positively distributed. Error deviation for AUD ranged from -0.7 to 0.5, and followed a negative parabolic shape.

Bivariate normality for each combination of the seven variables was assessed by visual inspection of bivariate distributions. As expected due to their skewness, bivariate combinations with Internalized Homonegativity and Heterosexist Experiences did not appear normally distributed. All other combinations of dependent variables appeared relatively normal. Due to a



lack of univariate and bivariate normality across Internalized Homonegativity and Heterosexist Experiences, and their bivariate combinations with other dependent variables, multivariate normality is not assumed. Although the assumption of normality is not met, we will continue with the analysis as planned, and interpret with caution.

### **Multicollinearity Assumption**

To assess for multicollinearity among independent variables, zero order correlations and Variance Inflation Factors (VIF) were assessed. See Table A9 above for correlation coefficients of the independent variables, and Table A10 below for the VIFs. VIFs for each variable fell far below 10, satisfying the assumption that independent variables are not multicollinear.

**Table A10**

*Variance Inflation Factors of General and Binegative Minority Stressors in the Multiple Regression Predicting Alcohol Use Disorder Symptoms among NOW*

<b>Independent Variable</b>	<b>VIF</b>
Acceptance Concerns	1.081
Concealment	1.581
Internalized Homonegativity	1.247
Heterosexist Experiences	1.333
Distal Binegative Minority Stress	1.736
Proximal Binegative Minority Stress	1.368

### **Homoscedasticity Assumption**

In order to assess for homoscedasticity, a scatterplot of predicted AUD scores on residuals was conducted and visually inspected. No clear pattern was observed in this scatterplot to suggest heteroscedasticity; therefore the assumption of homoscedasticity is not rejected.

## Appendix F

### Supplemental Analyses

In order to test whether bisexual-identified NOW differed in their PBS from NOW who indicated a sexual identity other than bisexual, an independent samples t-test was conducted. Mean scores on the full scale score of the BII were compared between bisexual-identified NOW ( $n = 165$ ) and NOW who indicated a sexual identity other than bisexual ( $n = 87$ ). Levene's Test for Equality of Variances was conducted for this comparison ( $F(1, 250) = 1.79, p = .191$ ) and was not rejected. A mean difference ( $t = -3.080, p = 0.085$ ) in proximal binegative minority stress was not identified (Table A11).

**Table A11**

*Sexual Identities Within-NOW Mean Comparison of Proximal Binegative Minority Stress*

<b>Group</b>	<b>M (SD)</b>
Bisexual Identified NOW	36.80 (12.83)
Non-bisexual identified NOW	39.87 (14.50)

In order to test whether NOW ( $n = 198$ ) and EOW ( $n = 18$ ) differed in their scores on the Illegitimacy of Bisexuality subscale, and independent samples t-test was conducted. Levene's Test for Equality of Variances was conducted for this comparison ( $F(1, 216) = 21.824, p < .001$ ) and was rejected. Using the corrected t-score and corresponding probabilities, e mean difference ( $t = 2.584, p = .014$ ) in Illegitimacy of Bisexuality was identified (Table 10), such that EOW endorsed higher scores than NOW.

**Table A12**

*Mean Comparison of Illegitimacy of Bisexuality between NOW vs. EOW*

<b>Group</b>	<b>M (SD)</b>
NOW	1.67 (3.35)
EOW	4.03 (5.21)



**Appendix G**

## Survey Instruments

 **Screener**

1. What is your gender?
  - a. Woman
  - b. Man
  - c. Transgender woman
  - d. Transgender man
  - e. Additional gender not listed above: \_\_\_\_\_
2. How frequently do you drink caffeinated beverages?
  - a. More than once a day
  - b. Once a day
  - c. Two or three times a week
  - d. Once a week
  - e. A few times a month
  - f. I don't drink caffeinated beverages
3. Are you a vegetarian (refrain from eating meat)?
  - a. Yes
  - b. No
4. Are you attracted to people of the same gender (even if you are also attracted to people of other genders)?
  - a. Yes
  - b. No
5. How frequently do you engage in cardio exercise?
  - a. More than once a day
  - b. Once a day
  - c. Two or three times a week
  - d. Once a week
  - e. A few times a month
  - f. I don't drink caffeinated beverages
6. How many hours of television (including streaming services such as Netflix or Hulu) do you watch a day?
  - a. 0 -1 hours
  - b. 2-4 hours
  - c. More than 4 hours
7. Have you ever engaged in sexual behavior with a person of the same gender?
  - a. Yes
  - b. No
8. Do you currently use nicotine products (e.g., cigarettes, chewing tobacco)?

- a. Yes
- b. No

### Demographic Questionnaire

1. What is your age? \_\_\_\_\_
2. What is your gender?
  - a. Woman
  - b. Man
  - c. Transgender woman
  - d. Transgender man
  - e. Additional gender not listed above: \_\_\_\_\_
3. What was your assigned sex at birth?
  1. Female
  2. Male
  3. Intersex
4. What group(s) do you belong to? (Please select all that apply.)
  1. Black/African American
  2. Hispanic/Latinx/Chicana/Chicano
  3. Asian or Pacific Islander
  4. White/European American/Caucasian
  5. Native American/American Indian
  6. Middle Eastern
  7. Multi-racial
  8. Other: \_\_\_\_\_
5. Are you currently in a romantic relationship?
  1. Yes
  2. No
  3. Other \_\_\_\_\_
6. Are you currently attending college/university?
  1. Yes
  2. No
  3. Other: \_\_\_\_\_
7. What is the highest level of education you have completed?
  1. High school diploma or equivalent
  2. Some college
  3. Associated degree or certificate
  4. Bachelor's degree
  5. Master's degree
  6. Doctoral degree
  7. Other, please specify \_\_\_\_\_
8. Were you born in the United States?
  1. Yes
  2. No
9. What state were you born in? (Drop-down selection)
10. What is your yearly household income (excluding taxes)?

1. Less than \$10,000
2. Between \$10,001 and \$20,000
3. Between \$20,001 and \$30,000
4. Between \$30,001 and \$40,000
5. Between \$40,001 and \$50,000
6. Between \$50,001 and \$60,000
7. Between \$60,001 and \$70,000
8. Between \$70,001 and \$80,000
9. Between \$80,001 and \$90,000
10. Between \$90,001 and \$100,000
11. More than \$100,000

### **Klein Sexual Orientation Grid**

Instructions: For each of the following 7 variables, you are asked to rate yourself for each of the three aspects of your life: your past self (defined as age 16 through one year ago), your present self (defined as the past year), and your ideal (defined as what you would choose to be now if it were a matter of choice).

For Variables I – I, use the following rating scale to rate yourself:

- 1 – Other gender only
- 2 – Other gender mostly
- 3 – Other gender somewhat more
- 4 – Other genders and same gender equally
- 5 – Same gender somewhat more
- 6 – Same gender mostly
- 7 – Same gender only

- I. To whom are you sexually attracted?
  - a. Past (age 16 through 1 year ago). Indicate one.
 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
  - b. Present (during past year). Indicate one.
 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
  - c. Ideal (what you would chose now if it were a matter of choice). Indicate one.
 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- II. Here we look at actual behavior as opposed to sexual attraction. With whom do you have sexual relationships?

- a. Past (age 16 through 1 year ago). Indicate one.  
1    2    3    4    5    6    7
- b. Present (during past year). Indicate one.  
1    2    3    4    5    6    7
- c. Ideal (what you would chose now if it were a matter of choice). Indicate one.  
1    2    3    4    5    6    7
- III. Whether they occur while daydreaming, during masturbation, as a part of our real lives, or purely in our imagination, fantasies provide insight. About whom do you have sexual fantasies?
- a. Past (age 16 through 1 year ago). Indicate one.  
1    2    3    4    5    6    7
- b. Present (during past year). Indicate one.  
1    2    3    4    5    6    7
- c. Ideal (what you would chose now if it were a matter of choice). Indicate one.  
1    2    3    4    5    6    7
- IV. Our emotions directly influence, if not define, the actual physical act of love. Ask yourself if you love and like only people of another gender or if you are also emotionally close to people of the same gender as you. Where are you on the scale?
- a. Past (age 16 through 1 year ago). Indicate one.  
1    2    3    4    5    6    7
- b. Present (during past year). Indicate one.  
1    2    3    4    5    6    7
- c. Ideal (what you would chose now if it were a matter of choice). Indicate one.  
1    2    3    4    5    6    7
- V. Though closely allied to emotional preference, social preference is often different. You may love only women but spend most of your social life with men. Some people, of all orientations, only socialize with people of the same gender, while others socialize with people of other genders exclusively. Where are you on the scale?
- a. Past (age 16 through 1 year ago). Indicate one.  
1    2    3    4    5    6    7
- b. Present (during past year). Indicate one.  
1    2    3    4    5    6    7
- c. Ideal (what you would chose now if it were a matter of choice). Indicate one.  
1    2    3    4    5    6    7

For Variables VI – VII, use the following rating scale:

1 – Heterosexual only

2 – Heterosexual mostly

3 – Heterosexual somewhat more

4 – Hetero/Gay-Lesbian Equally

5 – Gay/Lesbian somewhat more

6 – Gay/Lesbian mostly

7 – Gay/Lesbian only

VI. Some heterosexuals only have sex with people of another gender but prefer to spend the majority of their time with gay/lesbian people. On the other hand, gay/lesbian or bisexual persons may prefer to live exclusively in the gay/lesbian world, or even to live in both worlds. Where do you tend to spend time and with whom?

a. Past (age 16 through 1 year ago). Indicate one.

1    2    3    4    5    6    7

b. Present (during past year). Indicate one.

1    2    3    4    5    6    7

c. Ideal (what you would chose now if it were a matter of choice). Indicate one.

1    2    3    4    5    6    7

VII. Your sexual self-definition is a strong variable since self-image trongly affect our thoughts and actions. In some cases, a person’s present and past self-identification differ markedly from their ideal. Where are you on the scale?

a. Past (age 16 through 1 year ago). Indicate one.

1    2    3    4    5    6    7

b. Present (during past year). Indicate one.

1    2    3    4    5    6    7

c. Ideal (what you would chose now if it were a matter of choice). Indicate one.

1    2    3    4    5    6    7

### **Lesbian, Gay and Bisexual Identity Scale**

Preface: Some may prefer to use labels other than “lesbian, gay, and bisexual” to describe your sexual orientation (e.g., “queer,” “dyke,” “questioning”). We use the term LGB in this survey as a convenience, and we ask for your understanding if the term does not completely capture your sexual identity.

Instructions: For each of the following questions, please mark the response that best indicates your current experiences as honestly as possible: Indicate how you really feel now, not how you think you should feel. There is no need any one question. Answer each question according to your initial reaction and then move on to the next.

1 = Disagree strongly



2 = Disagree

3 = Disagree Somewhat

4 = Agree Somewhat

5 = Agree

6 = Strongly Agree

1. I prefer to keep my same-sex romantic relationships rather private.
2. If it were possible, I would choose to be straight.
3. I'm not totally sure what my sexual orientation is.
4. I keep careful control over who knows about my same-sex romantic relationships.
5. I often wonder whether others judge me for my sexual orientation.
6. I am glad to be an LGB person.
7. I look down on heterosexuals.
8. I keep changing my mind about my sexual orientation.
9. I can't feel comfortable knowing that others judge me negatively for my sexual orientation.
10. I feel that LGB people are superior to heterosexuals.
11. My sexual orientation is an insignificant part of who I am.
12. Admitting to myself that I'm an LGB person has been a very painful process.
13. I'm proud to be part of the LGB community.
14. I can't decide whether I am bisexual or homosexual.
15. My sexual orientation is a central part of my identity.
16. I think a lot about how my sexual orientation affects the way people see me.
17. Admitting to myself that I'm an LGB person has been a very slow process.
18. Straight people have boring lives compared with LGB people.
19. My sexual orientation is a very personal and private matter.
20. I wish I were heterosexual.
21. To understand who I am as a person, you have to know that I'm LGB.
22. I get very confused when I try to figure out my sexual orientation.
23. I have felt comfortable with my sexual identity just about from the start.
24. Being an LGB person is a very important aspect of my life.
25. I believe being LGB is an important part of me.
26. I am proud to be LGB.
27. I believe it is unfair that I am attracted to people of the same sex.

### **Heterosexist Harassment, Rejection and Discrimination Scale**

Instructions: Please think carefully about your life as you answer the questions below. Reach each question and then indicate the number that best describes events in the PAT YEAR, using these rules.

1 = Event has NEVER happened to you

2 = Event happened ONCE IN A WHILE (less than 10% of the time)

3 = Event happened SOMETIMES (10-25% of the time)

4 = Event happened A LOT (26-49% of the time)

5 = Event happened MOST OF THE TIME (50-70% of the time)

6 = Event happened ALMOST ALL OF THE TIME (more than 70% of the time)

1. How many times have you been treated unfairly by teachers or professors because you are a LESBIAN?
2. How many times have you been treated unfairly by your employer, boss, or supervisors because you are a LESBIAN?
3. How many times have you been treated unfairly by your co-workers, fellow students, or colleagues because you are a LESBIAN?
4. How many times have you been treated unfairly by people in service jobs (by store clerks, waiters, bartenders, waitresses, bank tellers, mechanics, and others) because you are a LESBIAN?
5. How many times have you been treated unfairly by strangers because you are a LESBIAN?
6. How many times have you been treated unfairly by people in helping jobs (by doctors, nurses, psychiatrists, caseworkers, dentists, school counselors, therapists, pediatricians, school principals, gynecologists, and others) because you are a LESBIAN?
7. How many times were you denied a raise, a promotion, tenure, a good assignment, a job or other such thing at work that you deserved because you are a LESBIAN?
8. How many times have you been treated unfairly by your family because you are a LESBIAN?
9. How many times have you been called a HETEROSEXIST name like dyke, lezzie or other names?
10. How many times have you been made fun of, picked on, pushed, shoved, hit, or threatened with harm because you are a LESBIAN?
11. How many times have you been rejected by family members because you are a LESBIAN?
12. How many times have you been rejected by friends because you are a LESBIAN?
13. How many times have you heard ANTI-GAY/ANTI-LESBIAN remarks from family members?

14. How many times have you been verbally insulted because you are a LESBIAN?

### **Bisexual Identity Inventory**

Instructions: The purpose of this scale is to measure the extent to which you identify with each of the following statements as it relates to identifying as a bisexual individual. Please circle the corresponding number for each item as it relates to you personally.

1. People probably do not take me seriously when I tell them I am bisexual.
2. I am grateful for my bisexual identity.
3. I am comfortable being bisexual.
4. I am reluctant to tell others of my bisexual identity.
5. I am proud to be bisexual.
6. Bisexual individuals are in denial about being gay.
7. I feel that I have to justify my bisexuality to others.
8. Identifying as bisexual is just the first step toward becoming gay.
9. I feel freedom with both men and women.
10. Being bisexual is rewarding to me.
11. It's unfair that I am attracted to people of more than one gender.
12. People might not like me if they found out that I am bisexual.
13. When I talk about being bisexual, I get nervous.
14. I am not a real person because I am bisexual.
15. I wish I could control my feelings and by directing them at a single gender.
16. I think that bisexual individuals are just indecisive.
17. Being bisexual is a cop out.
18. Bisexual identity is just a fleeting fad.
19. I am okay with my bisexuality.
20. My life would be better if I were not bisexual.
21. Being bisexual prevents me from having meaningful intimate relationships.
22. I think that being bisexual is just a temporary identity.
23. Bisexuality is not a real identity.
24. I would be better off if I would identify as gay or straight, rather than bisexual.

### **Daily Drinking Questionnaire**

Standard Drinking Conversion

One standard drink is equal to:

- One 12oz. can, bottle, or glass of Standard American Beer [3-5% alcohol]
- One 12 oz. can, bottle or glass of Standard Microbrew or European Beer [8-12% alcohol]
- One 4oz. glass of wine [12-17% alcohol]
- 10 oz. bottle of a wine cooler
- One standard shot or 1&1/2 oz. of hard liquor [80-proof, 40% alcohol]
- 1 oz. of hard liquor [100-proff, 50% alcohol]

Wine: 1 bottle

- 25 oz. (12-17% alcohol) = 5 standard drinks
- 40 oz. (12-17% alcohol) = 8 standard drinks

**Instructions for a Typical Week:** In the calendar below, please fill-in your drinking rate and time drinking during a typical week in the last 30 days.

First, think of a *typical week* in the last 30 days (Where did you live? What were your regular weekly activities? Where you working or going to school? Etc.) Try to remember as accurately as you can, *how much* and for *how long you typically drank* in a week that one month period?

For each day of the week in the calendar below, fill in the **number of standard drinks typically consumed on that day** in the upper box and the **typical number of hours you drank that day** in the lower box.

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							
Number of Hours Drinking							

Instructions for Heaviest Drinking Week: In the calendar below, please fill-in your drinking rate and time drinking during a heavy drinking week in the last 30 days.

First, think of your *heaviest drinking* week in the last 30 days (Where did you live? What were your regular weekly activities? Where you working or going to school? Etc.) Try to remember as accurately as you can, *how much* and for *how long* you did drink during your *heaviest drinking* week that one month period?

For each day of the week in the calendar below, fill in the **number of standard drinks typically consumed on that day** in the upper box and the **typical number of hours you drank that day** in the lower box.

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							
Number of Hours Drinking							

1. How often did you drinking during the last month?
  - a. I did not drink at all
  - b. About once a month
  - c. Two or three times a month
  - d. Once or twice a week
  - e. Three to four times a week
  - f. Nearly every day
  - g. Once a day or more
2. Thinking of a typical weekend evening (Friday or Saturday) during the last month. How much did you drink on that evening?
3. Think of the occasion (any day of the week) you drank the most during the last month. How much did you drink?

### **Alcohol Use Disorder Identification Test**

Instructions: Answer these questions about the past year.

1. How often do you have a drink containing alcohol?
  - 0 = Never
  - 1 = Monthly or less
  - 2 = 2 to 4 times a month
  - 3 = 2 to 3 times a week
  - 4 or more time a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?
  - 0 = 1 or 2
  - 1 = 3 or 4
  - 2 = 5 or 6
  - 3 = 7, 8, or 9
  - 4 = 10 or more
3. How often do you have six or more drinking on one occasion?
  - 0 = Never
  - 1 = Less than monthly
  - 2 = Monthly
  - 3 = Weekly
  - 4 = 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?
  - 0 = Never
  - 1 = Less than monthly

- 2 = Monthly
  - 3 = Weekly
  - 4 = Daily or almost daily
5. How often during the last year have you failed to do what was normally expected from you because of drinking?
- 0 = Never
  - 1 = Less than monthly
  - 2 = Monthly
  - 3 = Weekly
  - 4 = Daily or almost daily
6. How often during the last year have you needed a drinking I the morning to get yourself going after a heavy drinking session?
- 0 = Never
  - 1 = Less than monthly
  - 2 = Monthly
  - 3 = Weekly
  - 4 = Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking?
- 0 = Never
  - 1 = Less than monthly
  - 2 = Monthly
  - 3 = Weekly
  - 4 = Daily or almost daily
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
- 0 = Never
  - 1 = Less than monthly
  - 2 = Monthly
  - 3 = Weekly
  - 4 = Daily or almost daily
9. Have you or someone else been injured as a result of your drinking?
- 0 = No
  - 2 = Yes, but not in the past year
  - 4 = Yes, during the last year
10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?
- 0 = No
  - 2 = Yes, but not in the past year
  - 4 = Yes, during the last year

### Comprehensive Effect of Alcohol Questionnaire

Instructions: Choose from *disagree* to *agree* depending on whether you expect the effect to happen to you *if you were under the influence of alcohol*. These effects will vary, depending on the amount of alcohol you typically consume. Then rate these effects from *bad* to *good*, regardless of whether or not you expect the effect to occur or not. There are no right or wrong answers.

If I were under the influence of alcohol:

1. I would act sociable
2. It would be easier to talk to people
3. I would be friendly
4. I would be talkative
5. I would be outgoing
6. I would be humorous
7. It would be easier to express feelings
8. I would feel energetic
9. I would feel calm
10. I would feel peaceful
11. My body would feel relaxed
12. I would feel courageous
13. I would feel brave and daring
14. I would feel unafraid
15. I would feel powerful
16. I would feel creative
17. I would be a better lover
18. I would enjoy sex more
19. I would feel sexy
20. It would be easier to act out my fantasies
21. I would be clumsy
22. I would feel dizzy
23. My head would feel fuzzy
24. My responses would be slow
25. I would have difficulty thinking
26. My writing would be impaired
27. I would feel shaky or jittery the next day
28. My senses would be dulled
29. I would neglect my obligations
30. I would take risks
31. I would act aggressively

32. I would be loud, boisterous, or noisy
33. I would act tough
34. I would feel dominant
35. I would feel moody
36. I would feel guilty
37. I would feel self-critical
38. My problems would seem worse

### **Modified Drinking Motives Questionnaire- Revised**

**Instructions:** Listed below are 20 reasons people might be inclined to drink alcoholic beverages. Using the five point scale below, decide how frequently your own drinking is motivated by each of the reasons listed.

1 = almost never/never

2 =some of the time

3 = half of the time

4 = most of the time

5 = almost always/always

1. To forget your worries.
2. Because your friends pressure you to drink.
3. Because it helps you enjoy a party.
4. Because it helps you when you feel depressed or nervous.
5. To be sociable.
6. To cheer up when you are in a bad mood.
7. Because you like the feeling.
8. So that others won't kid you about not drinking
9. Because it's exciting.
10. To get high.
11. Because it makes social gatherings more fun.
12. To fit in with a group you like.
13. Because it gives you a pleasant feeling.
14. Because it improves parties and celebrations.
15. Because you feel more self-confident and sure of yourself.
16. To celebrate a special occasion with friends.
17. To forget about your problems.
18. Because it's fun.
19. To be liked.



20. So you won't feel left out.

### **Medical Outcomes Survey – Social Support Survey**

Instructions: People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

1 = None of the time

2 = A little of the time

3 = Some of the time

4 = Most of the time

5 = All of the time

1. Someone you can count on to listen to you when you need to talk
2. Someone to give you information to help you understand a situation
3. Someone to give you good advice about a crisis
4. Someone to confide in or talk to about yourself or your problems
5. Someone whose advice you really want
6. Someone to share your most private worries and fears with
7. Someone to turn to for suggestions about how to deal with a personal problem
8. Someone who understands your problems
9. Someone to help you if you were confined to bed
10. Someone to take you to the doctor if you needed it
11. Someone to prepare your meals if you were unable to do it yourself
12. Someone to help with daily chores if you were sick
13. Someone who shows you love and affection
14. Someone to love and make you feel wanted
15. Someone who hugs you
16. Someone to have a good time with
17. Someone to get together with for relaxation
18. Someone to do something enjoyable with

Appendix H

Figures

Figure A1

Power Analysis for Hypothesis 1

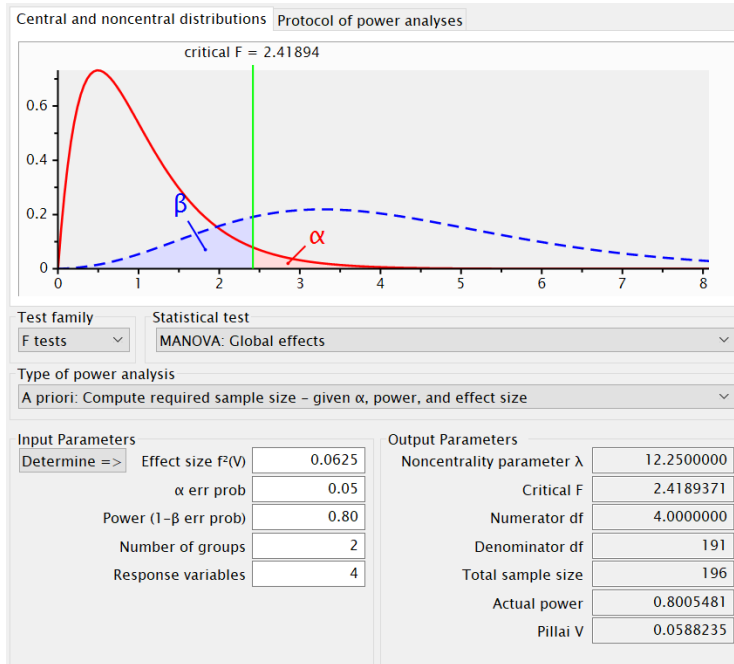
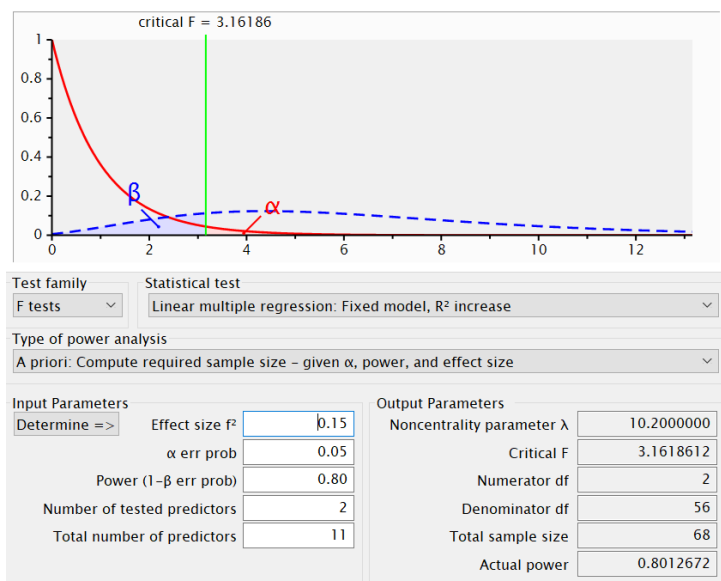


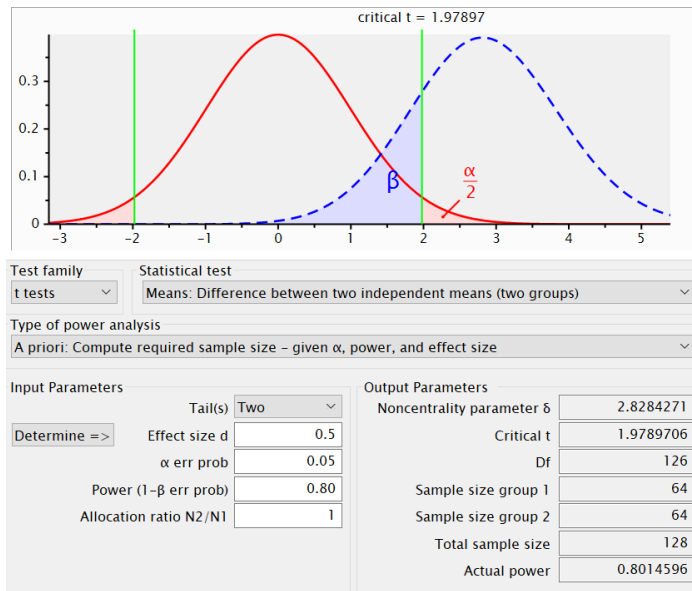
Figure A2

Power Analysis for Hypothesis 2



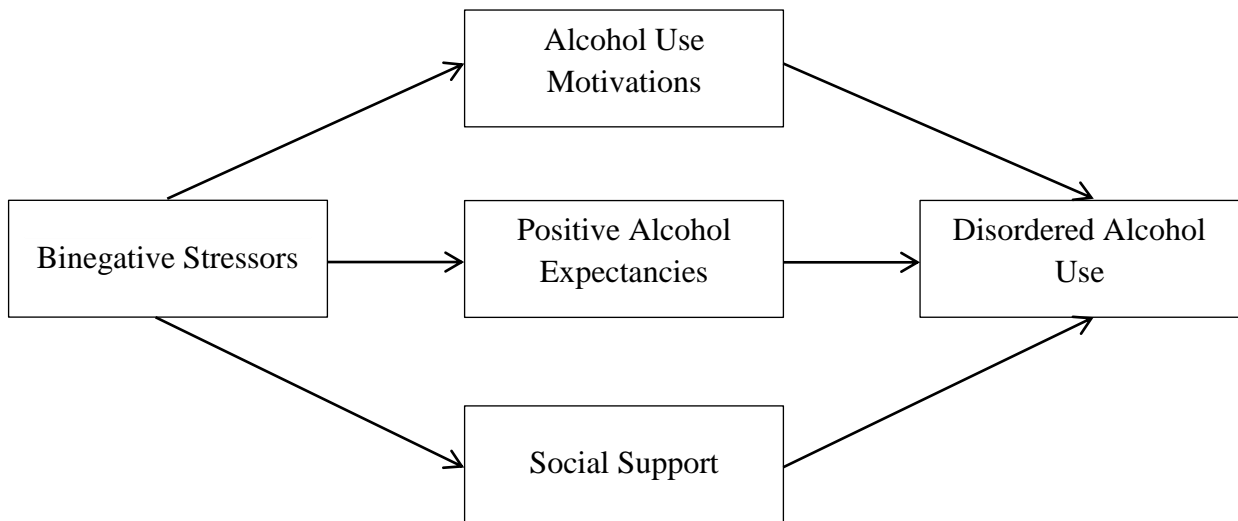
**Figure A3**

*Power Analysis for Hypothesis 3*



**Figure 4**

*Conceptual Model for Hypothesis 4*



## Appendix I

### Informed Consent and Debriefing Materials

#### Consent Form

Project Directors:

Kinise Dunham, B.A.

Bryan Cochran, Ph.D.

The University of Montana  
Department of Psychology  
Skaggs Building Room 143  
Missoula, MT 59812  
(406)-243-2391

Thank you for your interest in our study. The purpose of this study is to measure participants' general health behaviors, such as experiences with stress and alcohol use. You must be at least 18 years old to participate in this study, and your participation is entirely voluntary.

If you agree to take part in this study, you will complete an online survey. You will receive either direct compensation of \$5.00 for participating in this study, or you can elect to donate your compensation to the Trevor Project. For more information about the Trevor Project, please follow the below link. At the close of the survey, you may select whether to receive your compensation directly or to donate. The survey will take approximately 30 minutes to complete. As part of the survey, you will answer basic questions about yourself, questions regarding your stress in a variety of contexts and questions regarding your recent alcohol use. Remember, your participation is voluntary and you may choose to stop participating at any time without penalty. All of the information that you provide will be kept confidential. More information about the study and a list of resources will be provided to you at the end of the survey.

We believe that the risk of taking part in this survey is minimal. In the event you experience distress over the course of participating, we have provided a list of resources that you may contact.

If you have any questions about this study, please call Bryan Cochran at (406) 243-2391 or Kinsie Dunham (214) 566-0450, or you can email us at [bryan.cochran@umontana.edu](mailto:bryan.cochran@umontana.edu) or [kinsie.dunham@umontana.edu](mailto:kinsie.dunham@umontana.edu). Please remember that we cannot guarantee the confidentiality of any information sent by email. If you have any questions regarding your rights as a research subject, you may contact The University of Montana's Research Office at (406) 243-6670 and ask to speak with the IRB Chair.

By clicking the “I Agree” button below, I give my consent to take part in this study. Clicking this button also means that I am at least 18 years old and have read the description of this research study. I have been told about the risks and benefits involved, and all my questions have been answered to my satisfaction. Furthermore, I understand that if I have questions in the future, I can contact the researchers to have my question answered. Finally, I voluntarily agree to take part in this study.

#### Debriefing Statement

First, thank you for participating in this experiment. The data you have given us will be of great value in our research. The survey you have just completed focuses on understanding the relationship between stress, coping and alcohol use. Should you wish to learn more about this research, please contact the experimenter at [Kinsie.dunham@umontana.edu](mailto:Kinsie.dunham@umontana.edu), whom can provide you with more details and perhaps point you to some published research available on the internet. Thank you again.