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Understanding Co-Occurring Depression Symptoms and Alcohol Use Symptoms among
Sexual Minority Women

By

Briana Leigh McGeough

A dissertation submitted in partial satisfaction of the
requirements for the degree of

Doctor of Philosophy

in

Social Welfare

in the

Graduate Division

of the

University of California, Berkeley

Committee in Charge:

Professor Adrian Aguilera, Chair

Professor Paul Sterzing

Professor Sophia Rabe-Hesketh

Spring 2019

Abstract

Understanding Co-Occurring Depression Symptoms and Alcohol Use Symptoms among Sexual Minority Women

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Professor Adrian Aguilera, Chair

INTRODUCTION: Sexual minority (e.g., lesbian, bisexual) women experience depression and alcohol use disorder at approximately twice the rates of heterosexual women. Though stigma serves as a common explanation for these disparities, less is known about the mechanisms through which stigma may contribute to these disparities. Past research has found that the strategies that individuals use to regulate their emotions in response to experiences of stigma may influence their depression symptoms and alcohol use symptoms. Among general samples, alcohol use and suppression have been linked to increased risk for depression symptoms whereas seeking social support following a stigma-related stressor has been linked to reduced risk for depression symptoms. A limited body of past research has found constructs similar to suppression and social support to be associated with greater or fewer alcohol use symptoms, respectively, at the same level of alcohol use.

The current dissertation proposes and validates a model to test whether greater levels of alcohol use, greater levels of suppression, and lower levels of social support explain 1) sexual minority women's disproportionately high rates of depression symptoms/alcohol use symptoms and 2) the relationship between stigma-related stressors and depression symptoms/alcohol use symptoms for sexual minority women. (a) A greater number of stigma-related stressors are hypothesized to be associated with higher levels of suppression, higher levels of alcohol use, and lower levels of social support, (b) which are hypothesized to be associated with a greater number of depression symptoms. (c) Higher levels of alcohol use are hypothesized to be associated with a greater number of alcohol use symptoms; (d) higher levels of suppression are hypothesized to weaken this relationship, whereas higher levels of social support are hypothesized to strengthen this relationship.

METHODS: A national sample of 1,773 sexual minority women participated in an online survey in 2017 through the PRIDE Study. Respondents self-reported demographic information, number of experiences of stigma, levels of alcohol use, suppression, and social support, and number of depression and alcohol use symptoms. Structural equation modeling was used to test hypotheses

a to d (detailed above). Chi-square, RMSEA, CFI, and TLI were all employed to assess model fit.

RESULTS: (a) As hypothesized, a greater number of stigma-related stressors was associated with lower levels of social support (standardized coefficient estimate, $\beta = -0.185$; $p < 0.001$), but contrary to hypothesis, the number of stigma-related stressors was not significantly associated with levels alcohol use or suppression. (b) As hypothesized, lower levels of social support ($\beta = -0.210$; $p < 0.001$), higher levels of alcohol use ($\beta = 0.105$; $p < 0.001$), higher levels of suppression ($\beta = 0.169$; $p < 0.001$), and greater number of stigma-related stressors ($\beta = 0.220$; $p < 0.001$) were all significantly associated with a greater number of depression symptoms. (c) As hypothesized, higher levels of alcohol use ($\beta = 0.790$; $p < 0.001$) were significantly associated with a greater number of alcohol use symptoms, but contrary to hypothesis, greater numbers of stigma-related stressors did not predict a greater number of alcohol use symptoms. (d) Contrary to hypothesis, there was no evidence that relationship between alcohol use and alcohol use symptoms was strengthened by higher levels of suppression or weakened by higher levels of social support. All fit statistics exceeded established standards.

DISCUSSION: Stigma-related stressors were found to be associated with depression symptoms, but not alcohol use symptoms, among sexual minority women. Stigma-related stressors may cause sexual minority women to deplete their social support resources, potentially increasing risk for depression symptoms; this mechanism does not appear to drive alcohol use symptoms. This finding suggests that cultivating social support networks that are responsive to experiences of stigma may be an important component of depression treatments for sexual minority women. Though the cross-sectional design of this study limits the potential for causal inference, this study makes an important contribution to the literature by utilizing a largescale, national sample of sexual minority women to evaluate potential mechanisms driving both depression symptoms and alcohol use symptoms among this vulnerable population. Future research should use longitudinal methods to improve potential for causal inference. Future research should also identify mechanisms common to depression symptoms and alcohol use symptoms to facilitate the development of interventions for co-occurring depression and alcohol use disorders for this vulnerable population.

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Chapter 1: Introduction

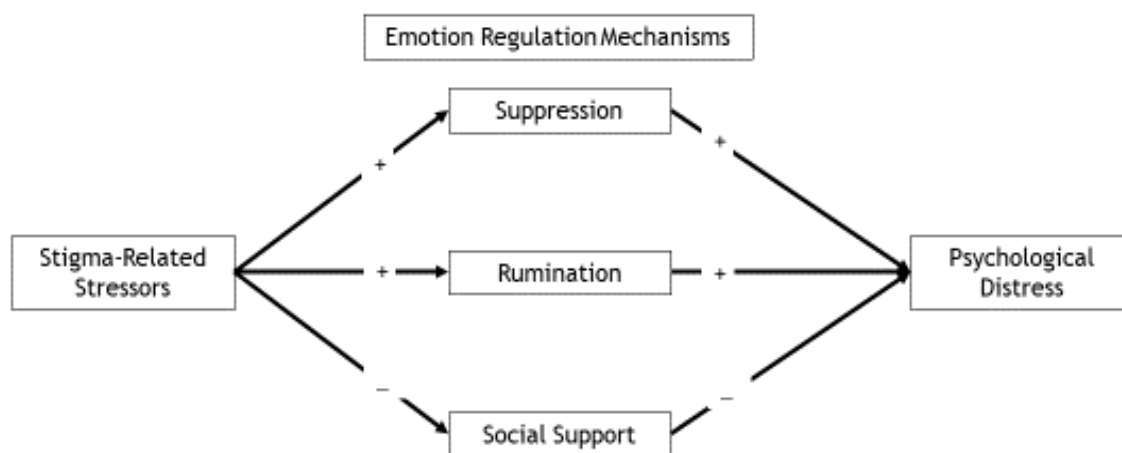
Sexual minority women (e.g., lesbian, bisexual, gay, pansexual, queer, and same-gender loving) consume alcohol with greater frequency and in higher quantities (Diamant et al., 2000; Hughes & Eliason, 2002) and disproportionately experience higher rates of alcohol use symptoms than their heterosexual female counterparts (Cochran & Mays, 2000). Moreover, sexual minority women experience higher rates of depression than their heterosexual female counterparts (Cochran, Greer, & Mays, 2003; Gilman et al., 2001). Though there are well-established associations between higher levels alcohol use (i.e., frequency and volume of alcohol consumption; Zemore et al., 2016), greater severity of alcohol use symptoms (i.e., distress and impairment related to alcohol consumption; American Psychiatric Association, 2013) and greater severity depression symptoms (i.e., distress and impairment related to feelings of sadness or lack of pleasure; American Psychiatric Association, 2013) among the general population (Boden & Fergusson, 2011; Zemore et al., 2016), no research known to the author has confirmed this association for sexual minority women. Furthermore, though no known research has specifically compared rates of co-occurring depression symptoms and alcohol use symptoms across sexual orientations, sexual minority women are more likely than their heterosexual female counterparts to concurrently engage in heavy drinking and experience depression (Pakula, Carpiano, Ratner, & Shoveller, 2016).

Stigma serves as a common explanation for the disparities in alcohol use symptoms, and depression symptoms between sexual minority women and their heterosexual counterparts (Cochran et al., 2003; Meyer, 2013). Link and Phelan (2001) define stigma as the “co-occurrence of its components—labeling, stereotyping, separation, status loss, and discrimination” (p. 363). Stigma has been linked to a range of mental and behavioral health problems for sexual minority individuals, including depression symptoms and alcohol use symptoms (Meyer, 2013). Despite these advances in understanding the presence of a connection between stigma and mental and behavioral health problems, there remains a paucity of research exploring the mechanisms through which stigma influences the development and maintenance of mental and behavioral health problems (Hatzenbuehler, Nolen-Hoeksema, & Dovidio, 2009).

Hatzenbuehler and colleagues (2009) identify a pathway linking stigma-related stressors (e.g., being treated with less courtesy and respect than other people; being called names or insulted; being threatened or harassed; being avoided) to emotional distress, arguing that the relationship between stigma-related stressors and psychological distress is mediated by the emotion regulation strategies of rumination, suppression, and social support, utilized in response to a stigma-related stressor. Hatzenbuehler and colleagues (2009) hypothesize that a greater number of stigma-related stressors will be associated with higher levels of rumination, higher levels of suppression, and lower levels of social support, which will be associated with higher levels of psychological distress. This manuscript defined suppression as “inhibiting emotionally expressive behaviors” (p. 2), rumination as the “tendency to passively and repetitively focus on one’s symptoms of distress and the circumstances surrounding these symptoms” (p. 2), and no definition was provided for social support. In other words, the strategies that a sexual minority individual utilizes to regulate their emotions following the experience of a stigma-related stressor corresponds to their experience of longer-term distress.

The model proposed by Hatzenbuehler and colleagues (2009) may hold promise for understanding the disparities in alcohol use, alcohol use symptoms, and depression symptoms that sexual minority women experience relative to heterosexual women.

Figure 1. Hatzenbuehler and colleagues' (2009) model of associations between stigma-related stressors, emotion regulation strategies, and psychological distress



Whereas alcohol use is the amount of alcohol consumption, alcohol use symptoms are the consequences of alcohol use, involving clinically significant impairment and distress (American Psychiatric Association, 2013). Though alcohol use is necessary for alcohol use symptoms to occur, there is only a modest association between amount and frequency of alcohol consumption, and the number and severity of alcohol use symptoms (Hoepfner, Kahler, & Jackson, 2011). Previous research has found that the relationship between alcohol use and alcohol use symptoms is not consistent across populations, and several studies have found that disadvantaged populations, specifically women, racial minorities, and low-income individuals, experience greater mental and physical health problems, at the same level of alcohol consumption relative to non-disadvantaged populations (CDC, 2016; Holmila & Raitasalo, 2005; Zeng et al., 2016). Though alcohol use can provide immediate relief from distress in the form of emotion regulation, it is also associated with longer-term distress (e.g., heightened levels of depression symptoms and alcohol use symptoms; Boden & Fergusson, 2011; Schuckit & Hasselbrock, 2014). Though less is known about how sexual orientation affects this relationship, prior research suggests that alcohol use is a common strategy for emotion regulation (Berking et al., 2011) and a common response to stigma-related stressors for sexual minority women (Lehavot & Simoni, 2011).

Though the function of alcohol use as an emotion regulation strategy may be similar to the function of suppression as an emotion regulation strategy, minimizing the experience of unwanted emotional states, the two involve distinct approaches to minimizing unwanted emotional states. Suppression involves attempting to directly minimize the emotional state or attempting to minimize the emotional state through attempting to reduce unpleasant thoughts, whereas alcohol use involves attempting to minimize the emotional state through the

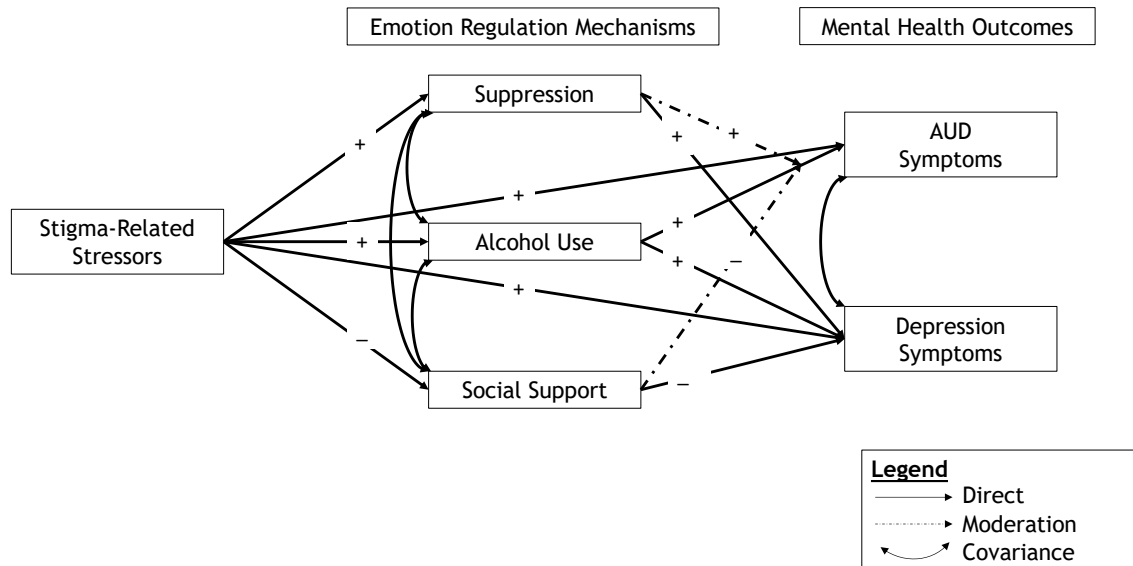
consumption of a psychoactive substance (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Such a distinction may have important implications for intervention, whereby an individual in treatment quits consuming alcohol but does not see some of the expected reductions in depression symptoms because they are continuing to engage in suppression.

This dissertation proposes an adapted version of the model created by Hatzenbuehler and colleagues (2009), with the goal of explaining sexual minority women's higher rates of depression symptoms and alcohol use symptoms relative to heterosexual women and describing the linkages between stigma-related stressors, alcohol use symptoms, and depression symptoms for sexual minority women. Phrased another way, this model proposes that as sexual minority women experience more instances of stigma-related stressors, they may engage in higher levels of suppression, higher levels of alcohol use, and lower levels of pursuing social support. Each of these responses may increase sexual minority women's risk for experiencing depression symptoms. Engaging in greater levels of alcohol use may also increase sexual minority women's risk for alcohol use symptoms. Furthermore, engaging in higher levels of suppression and lower levels of pursuing social support may strengthen the relationship between the levels of alcohol use and alcohol use symptoms for sexual minority women. Compared to the model advanced by Hatzenbuehler and colleagues (2009), the model proposed in this dissertation employs a broader definition of stigma, to more fully capture experiences of stigma that have been implicated in depression symptoms and alcohol use symptoms among sexual minority women. The proposed model features the addition of alcohol use as an emotion regulation strategy and depression symptoms and alcohol use symptoms in place of the existing psychological distress construct. The proposed model features the emotion regulation strategies of suppression (Hayes & Feldman, 2004) and social support (Hogan, Linden, & Najarian, 2002) as mediators of the relationship between stigma-related stressors and depression symptoms. This proposed model features an additional emotion regulation strategy, alcohol use (Fals-Stewart, O'Farrell, & Lam, 2009), as a mediator of the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms. Suppression, social support, and alcohol use now serve to mediate the relationships between stigma and depression symptoms. Alcohol use now serves to mediate the relationship between stigma and alcohol use symptoms, and the relationship between alcohol use and alcohol use symptoms is now moderated by suppression and social support. This proposed model has removed rumination as an emotion regulation strategy; please see Table 1 and Figure 3 for a summary of the modifications made to Hatzenbuehler and colleagues' (2009) model. The modifications to the model are described in further detail and justified below.

This model is particularly conducive to the development of interventions for sexual minority women struggling with depression symptoms and alcohol use symptoms, because there exist evidence-based interventions that target each of these mechanisms: suppression (mindfulness-based cognitive therapy; Teasdale et al., 2000), social support (social skills training in cognitive-behavioral therapy; Herbert et al., 2005) and alcohol use (mindfulness-based relapse prevention; Bowen et al., 2009; cognitive-behavioral therapy; Magill & Ray, 2009). Furthermore, interventions targeted toward these mechanisms have also been linked to reductions in alcohol use symptoms (Bowen et al., 2009) and depression symptoms (Butler et al., 2003; Herbert et al., 2005; Magill & Ray, 2009; Segal, Williams, & Teasdale 2002; Watkins et al., 2011). Because these interventions have been linked to reductions in maladaptive emotion regulation mechanisms (suppression, social isolation, and alcohol use) and depression symptoms and alcohol use symptoms, techniques from these interventions can likely be applied to reducing

these mechanisms and both single disorder and co-occurring mental health symptoms among sexual minority women.

Figure 2. Proposed model of associations between stigma-related stressors, emotion regulation strategies, and mental health outcomes



Research Aims and Conclusion

Utilizing a large, secondary dataset of sexual minority women ($N = 1,773$), the current dissertation proposes and validates a model to test whether greater levels of alcohol use, greater levels of suppression, and lower levels of social support explain 1) sexual minority women's disproportionately high rates of depression symptoms and alcohol use symptoms and 2) the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms for sexual minority women. A greater number of stigma-related stressors are hypothesized to be associated with higher levels of suppression, higher levels of alcohol use, and lower levels of social support, which are hypothesized to be associated with a greater number of depression symptoms. Higher levels of alcohol use are hypothesized to be associated with a greater number of alcohol use symptoms; higher levels of suppression are hypothesized to weaken this relationship, whereas higher levels of social support are hypothesized to strengthen this relationship. These hypotheses are described in greater depth at the end of the literature review.

Given sexual minority women's disproportionate rates of depression symptoms and alcohol use symptoms, it is critical that we more fully understand the mechanisms driving sexual minority women's depression symptoms and alcohol use symptoms and develop strategies for responding to these mechanisms. Better understanding the mechanisms driving disparities in

depression symptoms and alcohol use symptoms among sexual minority women could provide critical insight into how mental health workers can better address depression symptoms and alcohol use symptoms for these women.

Chapter 2: Review of the Literature

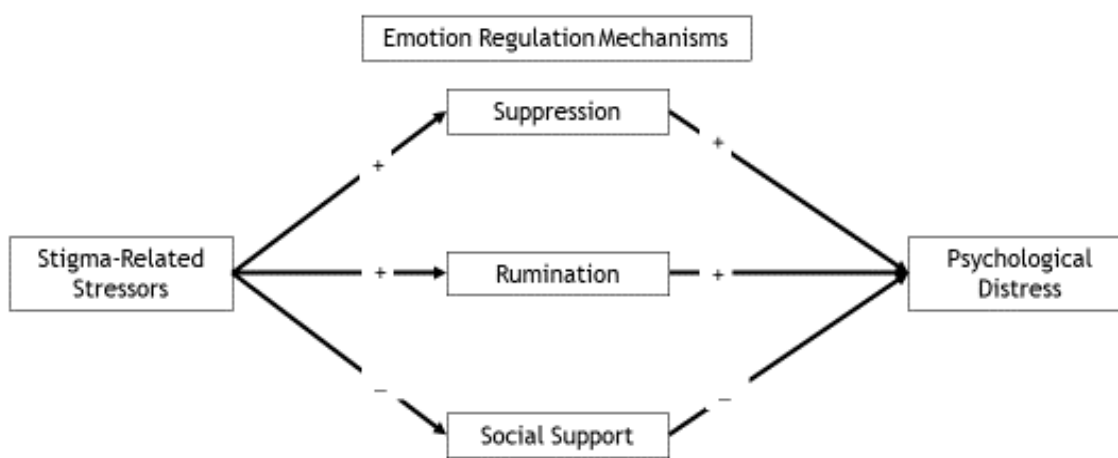
Sexual minority women (e.g., lesbian, bisexual, pansexual, gay, queer, and same-gender loving) consume alcohol with greater frequency and in higher quantities (Diamant et al., 2000; Hughes & Eliason, 2002) than heterosexual women. Sexual minority women also disproportionately experience higher rates of alcohol use symptoms (i.e., frequency and volume of alcohol consumption; Zemore et al., 2016) and depression symptoms (i.e., distress and impairment related to feelings of sadness or lack of pleasure; American Psychiatric Association, 2013) than their heterosexual female counterparts (Cochran, Greer, & Mays, 2003; Cochran & Mays, 2000; Gilman et al., 2001). A robust body of research has found higher levels of alcohol use symptoms to be associated with higher levels of depression symptoms among the general population (Boden & Fergusson, 2011; Zemore et al., 2016), and Bostwick and colleagues (2005) found higher levels of past year alcohol use symptoms to be significantly associated with higher levels of both past year and lifetime depression among sexual minority women. Sexual minority women are more likely than their heterosexual female counterparts to concurrently engage in heavy drinking and experience depression (Pakula, Carpiano, Ratner, & Shoveller, 2016). Taken together, these findings may suggest that co-occurring depression symptoms and alcohol use symptoms are a significant problem among the population of sexual minority women.

Explanations for Disparities in Depression Symptoms and Alcohol Use Symptoms among Sexual Minority Women

Stigma serves as a common explanation for the disparities in depression symptoms and alcohol use symptoms between sexual minority women and heterosexual women (Cochran et al., 2003; Meyer, 2013). Stigma (i.e., the co-occurrence of labeling, stereotyping, separation, status loss, and discrimination; Link & Phelan, 2001) has been found to predict to a range of mental and behavioral health problems for sexual minority individuals, including depression symptoms and alcohol use symptoms (Meyer, 2013). According to Meyer (2013), “stigma, prejudice, and discrimination create a hostile and stressful social environment that causes mental health problems” (p. 1). To explicate the association between stigma and mental health problems, Meyer (2012) advanced the Minority Stress Model, which is seminal to explaining sexual orientation-related disparities in health and mental health outcomes. This model argues that all individuals experience general stress (i.e., “events and conditions (e.g., losing a job, death of an intimate) that cause change and that require that the individual adapt to the new situation or life circumstance” p. 2). However, it is minority stress (i.e., the excess stress, in addition to general stress, that individuals from stigmatized social groups experience as a result of their social position as minorities) that may help to explain sexual minority women’s disproportional rates of depression symptoms and alcohol use symptoms (Hatzenbuehler et al., 2009; Meyer, 2013). According to the model, minority stressors can take the form of external events, such as discrimination or violence or internal processes, such as internalized homophobia, concealment, and expectations of rejection (definitions of these constructs and other constructs in the extant literature can be found in Table 16 in Appendix A).

Though Meyer's (2013) Minority Stress Model makes a critical advance in identifying the connection between stigma and mental and behavioral health problems, it does not provide insight into the mechanisms through which stigma influences the development and maintenance of mental and behavioral health problems (Hatzenbuehler, Nolen-Hoeksema, & Dovidio, 2009). This is a critical gap because many evidence-based clinical interventions (e.g., cognitive-behavioral therapies) argue that it is not experiences in the environment (including experiences of stigma) that result in mental health outcomes, but rather one's cognitive and behavioral responses to these experiences, that result in mental health problems, such as depression symptoms and alcohol use symptoms (Tolin, 2016). By determining modifiable mechanisms that explain the association between stigma and mental health outcomes, we may be able to improve these mental health outcomes by using existing evidence-based practices to target these mechanisms.

Figure 1. Hatzenbuehler and colleagues' (2009) model of associations between stigma-related stressors, emotion regulation strategies, and psychological distress (re-presented)



To begin to address the critical gap of mechanisms explaining the relationship between stigma and mental health outcomes, Hatzenbuehler and colleagues (2009) build on Meyer's (2013) Minority Stress Model to introduce factors amenable to intervention that might ameliorate the mental health consequences of minority stressors. The logic behind this model is that the strategies that a sexual minority individual utilizes to regulate their emotions following the experience of a stigma-related stressor may correspond to their experience of longer-term distress. Hatzenbuehler and colleagues (2009) identify a pathway linking stigma-related stressors (e.g., being treated with less courtesy and respect than other people; being called names or insulted; being threatened or harassed; being avoided) to emotional distress over a 10-day period, arguing that the relationship between stigma-related stressors and psychological distress is mediated by the emotion regulation strategy of rumination, suppression, and social support,

utilized in response to a stigma-related stressor. Hatzenbuehler and colleagues (2009) hypothesize that a greater number of stigma-related stressors will be associated with higher levels of rumination, higher levels of suppression, and lower levels of social support, which will be associated with higher levels of psychological distress. This manuscript defined suppression as “inhibiting emotionally expressive behaviors” (p. 2), rumination as the “tendency to passively and repetitively focus on one’s symptoms of distress and the circumstances surrounding these symptoms” (p. 2), and no definition was provided for social support. When this model was subject to empirical testing, all theorized associations, except suppression as a mediator, were found to be significant in the hypothesized direction (Hatzenbuehler et al., 2009).

This dissertation aims to propose and validate a model to determine whether the emotion regulation mechanisms of suppression, social support, and alcohol use explain sexual minority women’s disproportionately high rates of depression symptoms and alcohol use symptoms and the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms for sexual minority women. The logic and some of the constructs contained in the model proposed by Hatzenbuehler and colleagues (2009) may hold promise for understanding disparities in depression symptoms and alcohol use symptoms that sexual minority women experience relative to heterosexual women and the mechanisms that may drive the association between stigma and depression symptoms and alcohol use symptoms for this population. To justify the use of this model as a starting point for the model proposed in this dissertation, this chapter will: 1) summarize the extant literature about constructs in the proposed model and the relationships between them; 2) provide rationale for modifications made to Hatzenbuehler and colleagues’ (2009) model in service of constructing a model focused on depression symptoms and alcohol use symptoms among sexual minority women; 3) reconcile tensions between the model proposed in this dissertation and the research described in this literature review.

Extant Literature on Proposed Model Constructs

Stigma

Stigma, defined as the “co-occurrence of its components—labeling, stereotyping, separation, status loss, and discrimination” (Link & Phelan, 2001; p. 363), has been linked to a variety of mental and behavioral health problems for sexual minority individuals (Meyer, 2013). Many studies have documented sexual minority women’s experiences of sexual orientation- and gender-based stigma (Bostwick, Boyd, Hughes, & West, 2014; Herek, 2009), including a study by Bostwick, Boyd, Hughes, and West (2014) that found that 54.3% of lesbian and 17.2% of bisexual women reported experiencing sexual orientation-based discrimination and 48.0% of lesbian and bisexual women reported experiencing gender-based discrimination in the past year. Increases in stigma-related stressors (e.g., harassment, workplace discrimination, and other prejudice-related events) are associated with worsening depression symptoms and alcohol use symptoms (Lehavot & Simoni, 2011).

Modifications to stigma construct as proposed by Hatzenbuehler and colleagues (2009). Though both Hatzenbuehler and colleagues’ (2009) model and the model proposed in this dissertation include the construct of stigma-related stressors, this construct is operationalized slightly differently across these two models. Whereas in Hatzenbuehler and colleagues’ (2009) model, the stigma-related stressors measure only included stressors operating at the interpersonal

level (e.g., being called names), the stigma-related stressors measure in the proposed study includes stressors operating at the interpersonal level (e.g., being called names) as well as the institutional level (e.g., housing discrimination). Such a modification is justified because past research has utilized a broader conceptualization of stigma, including instances of stigma operating at both interpersonal and institutional levels; such research has found experiences of this more general conceptualization of stigma to predict general mental health symptoms among sexual minority women, utilizing a measure that included both depression symptoms and alcohol use symptoms (Mays & Cochran, 2001). The inclusion of both individual and institutional level components is also common practice in measures of the frequently-utilized, closely-related construct of perceived discrimination (Kessler, Mickelson & Williams, 1999; Mays & Cochran, 2001).

Emotion regulation mechanisms

The model proposed in this dissertation includes three emotion regulation mechanisms (suppression, social support, and alcohol use) that are proposed to be mechanism contributing to the association between stigma-related stressors and depression symptoms/alcohol use symptoms. Each will be discussed in detail below, including the definition of each emotion regulation strategy, known sexual orientation- and gender-related disparities in the use of each strategy, known associations between each of the emotion regulation mechanisms, and rationale for adapting Hatzenbuehler and colleagues' (2009) model.

Suppression. In the model advanced by Hatzenbuehler and colleagues (2009), suppression was defined as “inhibiting emotionally expressive behaviors” (p. 2). Suppression is theorized in this model to be an important factor for sexual minority women because sexual orientation and gender have been linked to suppression and suppression-related psychological distress. According to Hatzenbuehler (2009), lesbian women may, on average, engage in suppression to a greater extent than do heterosexual women. In evaluating the original model, Hatzenbuehler and colleagues (2009) did not find support for the hypothesis that suppression mediates the relationship between stigma-related stressors and psychological distress; however, this study only included a small sample (n=15) of sexual minority women and the authors call for further research utilizing larger samples. Suppression has been linked to stigma. In a study of sexual minority individuals that included sexual minority women, Hatzenbuehler and colleagues (2009) found that suppression occurred more on days when stigma-related stressors were reported than on days when no such stressors were reported.

Greater levels of suppression have been found to be associated with lower levels of social support (Graham, Huang, Clark, & Helgeson, 2008). This relationship is theorized in the direction that reducing suppression improves social support by facilitating intimacy and the reception of social support in times of need. Two studies have examined the relationship between suppression and alcohol use: Williams and Hasking (2010) found there to be no association between suppression and alcohol use; meanwhile, Lynne, Russell, and George (1988) found individuals who engaged in suppression to be more likely to drink to cope, a form of drinking they found to be more strongly associated with alcohol-related consequences than drinking that was not motivated by coping.

Social support. Though there is no agreed-upon definition of social support, Hogan and colleagues (2002) write that features of social support are “the structural aspects of social

networks (e.g., the size of a person's social circle or the number of resources provided), functional aspects of social support (e.g., emotional support or a sense of acceptance), and enacted support (e.g., provision of specific supportive behaviors, such as reassurance or advice, in times of distress), as well as the subjective perception of support by the recipients" (p. 382). The extant literature does not provide a clear picture of how sexual minority women's levels of social support compare to other demographic groups. On one hand, women are more likely to seek social support than are men (Nolen-Hoeksema & Aldao, 2011). On the other hand, on average, sexual minority individuals have less social support than do their heterosexual counterparts (Eisenberg & Resnick, 2006; Jorm, Korten, Rodgers, Jacomb, & Christensen, 2002; Needham & Austin, 2010). No known research has compared levels of social support between sexual minority women and sexual minority men.

The literature connecting social support to the other emotion regulation mechanisms included in the proposed model is sparse. As noted above, greater levels of suppression are associated with lower levels of social support (Graham et al., 2008). Context may be important for understanding the relationship between social support and alcohol use, with bar culture potentially serving as an important factor for understanding this relationship. According to Heffernan (1998), overall level of social support did not predict levels of alcohol use; however, the most significant predictor of alcohol use was reliance on bars as a primary social setting. Relatedly, in a study of sexual minority men, McKirnan and Peterson (1988) found that discrimination experiences were associated with utilizing gay bars as a primary social setting, which was associated with higher rates of alcohol-related problems; no known study has examined the relationships between alcohol use and social support or suppression for sexual minority women.

Modifications to emotion regulation mechanisms as proposed by Hatzenbuehler and colleagues (2009)

Removal of rumination. Rumination has been removed from the model due to its controversial status as an emotion regulation mechanism. The function of rumination is not agreed upon in the extant literature (Moulds et al., 2007; Smith & Alloy, 2009). Though one school of thought argues that rumination constitutes an avoidance-based emotion regulation strategy, asserting that individuals ruminate in order to avoid more emotionally aversive thoughts and activities, such as problem-solving (Moulds et al., 2007), minimal evidence exists to support this claim (Smith & Alloy, 2009). Others argue that rumination instead serves a problem-solving function, enabling individuals to thoroughly consider approaches to achieving goals (Smith & Alloy, 2009). One piece of evidence that supports this argument is that rumination has been linked to activity in portions of the right hemisphere of the brain that have been found to be connected with active problem solving (Smith & Alloy, 2009). Another school of thought is that rumination is not an emotion regulation strategy but rather an unintended consequence of suppression (Gross & John, 2003). A consistent finding in the literature is that despite their opposing aims, suppression strongly predicts rumination (Gross & John, 2003). Gross and John (2003) argue that by preventing the expression of distressing thoughts (i.e., venting), suppression may lead to a chronic preoccupation with particular distressing thoughts (i.e., rumination).

Addition of alcohol use. Alcohol use can be measured in many different ways. Alcohol use can be understood as the average volume of alcohol that an individual consumes (Rehm et

al., 2003) or the number of days that an individual engages in any drinking or heavy drinking (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Alcohol use can also be measured in terms of its use as a response to stressors. For instance, in a sample of sexual minority women, greater levels of perceived stress was associated with greater frequency of getting drunk in the past month (Heffernan, 1998); this relationship may hold for stigma-related stressors as well.

Alcohol use may be an increasingly important consideration for sexual minority women. Though, on average, men consume alcohol in greater volume than do women, these differences have been declining in recent years (Keyes, Grant, & Hasin, 2008). Furthermore, sexual minority women consume alcohol with greater frequency and in higher amounts than their heterosexual female counterparts (Diamant et al., 2000; Hughes & Eliason, 2002). Though no known research has examined trends in sexual minority women's alcohol use, the findings that women are consuming alcohol in higher amounts than in the past and that sexual minority women consume more alcohol than their heterosexual counterparts may possibly suggest that alcohol use among sexual minority women may be increasing.

Results are mixed for the association between suppression and alcohol use: One study found suppression was not linked to alcohol use (Williams & Hasking, 2010) but another study found individuals who suppressed emotions were more likely to drink to cope (Lynne et al., 1988). Though the function of alcohol use as an emotion regulation strategy may be similar to the function of suppression as an emotion regulation strategy, minimizing the experience of unwanted emotional states, the two involve distinct approaches to minimizing unwanted emotional states. Suppression involves attempting to directly minimize the emotional state or attempting to minimize the emotional state through attempting to reduce unpleasant thoughts, whereas alcohol use involves attempting to minimize the emotional state through the consumption of a psychoactive substance (Aldao et al., 2010). Such a distinction may have important implications for intervention, whereby an individual in treatment quits consuming alcohol but does not see some of the expected reductions in depression symptoms because they are continuing to engage in suppression.

Research also suggests that in the presence of bar culture, social support may be associated with alcohol use: A study of sexual minority men found that those who used bars as a primary social setting consumed greater quantities of alcohol and experienced more alcohol-related consequences (McKirnan & Peterson, 1988). This study also found that having more discrimination experiences was associated with greater likelihood of using bars as a primary social setting, which was, in turn, associated with more alcohol-related consequences (McKirnan & Peterson, 1988). Though the study by McKirnan and Peterson (1988) is the only known study to describe the relationship between alcohol use and sexual minority individuals, it is worth noting that this study is dated and did not include sexual minority women in its sample.

There are several reasons that alcohol use fits into this model as an emotion regulation strategy that mediates the relationship between stigma-related stressors and mental health outcomes. Firstly, there is evidence that alcohol is a common emotion regulation strategy (Berking et al., 2011) and a common response to stigma-related stressors for sexual minority women (Lehavot & Simoni, 2011). Secondly, alcohol use can influence the experience of mental health symptoms longer-term. Though higher levels of alcohol use can provide immediate relief from distress in the form of emotion regulation, it is also linked to greater levels of longer-term distress (e.g., greater levels of alcohol use symptoms and depression; Boden & Fergusson, 2011; Schuckit & Hasselbrock, 2014).

Mental Health Outcomes

The model proposed in this dissertation includes two mental health outcomes (depression symptoms and alcohol use symptoms). Both mental health outcomes will be discussed in detail below, including the definition of each mental health outcome, known sexual orientation- and gender-related disparities in each mental health outcome, known associations between each mental health outcome and the emotion regulation mechanisms that are proposed to drive them, and rationale for adapting Hatzenbuehler and colleagues' (2009) model to include depression symptoms and alcohol use symptoms as the outcomes in the model.

Depression symptoms. Depression symptoms are defined as the distress and impairment related to feelings of sadness or lack of pleasure (American Psychiatric Association, 2013). Sexual minority women experience higher rates of depression symptoms than their heterosexual female counterparts (Cochran, Greer, & Mays, 2003; Gilman et al., 2001). Greater levels of alcohol use has been linked to greater levels of depression symptoms. A meta-analysis that attempted to identify the causal relationships between alcohol use and depression symptoms drew upon standards of causality (e.g., temporal order, reversibility, plausible mechanism) to provide support for the directionality of a causal pathway whereby alcohol use causes depression (Rehm et al., 2003). Rehm and colleagues (2003) argue that alcohol use likely causes depression based on the proportion of comorbidity where alcohol use precedes the onset of depressive symptoms (temporal order), abstinence from alcohol use leads to a significant reduction in depressive symptoms (reversibility), and plausible biological mechanisms whereby alcohol use serves as a depressant (plausible mechanism). Hussong and colleagues (2001) advance such a mechanism, arguing that alcohol is a central nervous depressant and reporting that drinking to relieve negative affect predicts elevations in negative affect in subsequent weeks. No known research examining the direction of causality between alcohol use and depression considered differences by gender or sexual orientation. Greater levels of suppression have been found to predict greater levels of depression symptoms (Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Wegner & Zanakos, 1994; Werner, Goldin, Ball, Heimberg, & Gross, 2011).

Similar to the findings of Hatzenbuehler and colleagues (2009), Mickelson (2001) reports that social support mediates the relationship between perceived stigma and depression, arguing that greater levels of stigma are associated with lower levels of social support, which are, in turn, associated with greater levels of depression symptoms. Relatedly, Cohen and Wills (1985) found greater perceived social support to weaken the relationship between stressful events and depression. Peirce, Frone, Russell, Lynne, and Mudar (2000) found higher levels of perceived social support to be associated with lower levels of depression symptoms. Similarly, greater levels of perceived social support have also been found to be associated with lower levels of depression symptoms (Zimet, Dahlem, Zimet, & Farley, 1988). Greater levels of social support (operationalized as size and diversity of social network) were found to be associated with reduced risk of developing alcohol use symptoms (Mowbray, Quinn, & Cranford, 2014).

Alcohol use symptoms. Alcohol use symptoms are defined as the distress and impairment related to alcohol consumption (American Psychiatric Association, 2013). Sexual minority women experience alcohol use symptoms at higher rates than their heterosexual counterparts (Cochran & Mays, 2000). The constructs of alcohol use and alcohol use symptoms are related in complex ways. Whereas alcohol use is the amount of alcohol consumption, alcohol

use symptoms are the consequences of alcohol use that involve clinically significant impairment and distress (American Psychiatric Association, 2013). Despite alcohol use being required for alcohol use symptoms, there is only a modest association between greater amount and frequency of alcohol consumption (i.e., alcohol use) and a greater number and severity of alcohol use symptoms (i.e., alcohol use symptoms; Hoepfner et al., 2011). Furthermore, the relationship between alcohol use and alcohol use symptoms is not consistent across populations; several studies have found that disadvantaged populations, specifically women, racial minorities, low-income individuals, experience greater consequences of alcohol use, such as mental and physical health problems, at the same level of alcohol consumption as non-disadvantaged populations (CDC, 2016; Holmila & Raitasalo, 2005; Zemore et al., 2016). Only a small number of factors have been explored as potential moderators that strengthen or weaken the relationship between alcohol use and alcohol use symptoms. In a study of Black and Latino men, Zemore and colleagues (2016) found lower socioeconomic status, greater prejudice and unfair treatment, unmarried status, and younger age and Herd (1994) found unemployment to increase the risk of alcohol use symptoms at the same level of alcohol use. Suppression has been found to moderate the relationship between volume of alcohol use and alcohol use symptoms, predicting higher levels of alcohol use symptoms at the same volume of alcohol use (Norberg et al., 2016). Though women have been found to have higher levels of alcohol use symptoms at the same level of alcohol consumption as men, no known research has examined the gender-related psychosocial factors that may moderate the relationship between alcohol use and alcohol use symptoms across genders. However, as noted above, women are more likely to engage in drinking motivated by coping, which is a risk factor for alcohol symptoms, and may serve as a plausible moderator, strengthening the relationship between alcohol use and alcohol use symptoms (Heffernan, 1998; Lynne, Russell, & George, 1988; Lynne, Russell, Skinner, Frone, & Mudar, 1992). No known studies have examined factors that may moderate the relationship between alcohol use and alcohol use symptoms across sexual orientations.

Additional Modifications to the model by Hatzenbuehler and colleagues (2009)

Depression symptoms and alcohol use symptoms in place of psychological distress.

As noted above, a primary adaptation to the model advanced by Hatzenbuehler and colleagues (2009) is the replacement of the psychological distress outcome variable with measures of depression symptoms and alcohol use symptoms. This change was essential as the model proposed in this dissertation is testing mechanisms that may help explain the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms.

There are two primary advantages to utilizing symptom measures for existing diagnostic categories of alcohol use and depression rather than measures of affective states. Firstly, using symptom measures of existing disorders facilitates the development of a model that can explain co-occurring depression symptoms and alcohol use symptoms. Many evidence-based practices have been developed for depression symptoms and alcohol use symptoms (e.g., Berking et al., 2011; DiTomasso et al., 2007). Thus, using depression symptoms and alcohol use symptoms facilitates the application of existing interventions for individuals with co-occurring depression symptoms and alcohol use symptoms. Secondly, whereas affect is a fluctuating emotional experience, mood is a pervasive and sustained emotional experience (American Psychiatric Association, 2013). Criteria for psychiatric diagnoses, such as Major Depressive Disorder,

primarily focus on more sustained mood symptoms rather than fluctuating affective experiences (e.g., sadness present for more than two weeks). A distinction between affect and mood is important because many mindfulness interventions oriented toward reducing more sustained alcohol use symptoms or depression (i.e., mood) symptoms encourage clients to more actively experience affects (e.g., Mindfulness-Based Relapse Prevention; Bowen et al., 2009).

There is a theoretical and empirical basis for making this adaptation. Hatzenbuehler (2009) developed another model, the Psychological Mediation Framework, that links stigma-related stressors (i.e., objective prejudice events) to psychopathology (e.g., substance use, depression, and anxiety) through the theorized mediators of coping/emotion regulation (e.g., rumination and coping motives), social/interpersonal factors (e.g., social isolation and social norms) and cognitive factors (e.g., hopelessness, negative self-schemas, and alcohol expectancies). This model has a similar structure to the model advanced by Hatzenbuehler and colleagues (2009), but uses mental health symptoms instead of psychological distress as the outcome.

The current model hypothesizes that a greater number of alcohol use symptoms will be associated with a greater number of depression symptoms. Past research has found these two constructs to be strongly associated. Bostwick and colleagues (2005) found higher levels of past year alcohol use symptoms to be significantly associated with higher levels of both past year and lifetime depression among sexual minority women. Boden & Fergusson (2011) found possessing a sufficient number of symptoms to meet diagnostic criteria for either disorder to double the odds of experiencing the other disorder among a general sample.

Alcohol use and alcohol use symptoms as two distinct constructs. As described in the literature review above, alcohol use and alcohol use symptoms are distinct constructs. Whereas alcohol use is the amount of alcohol consumption, alcohol use symptoms are the consequences of alcohol use that involve clinically significant impairment and distress (American Psychiatric Association, 2013). There is only a modest association between a greater amount and frequency of alcohol consumption and a greater number and severity of alcohol use symptoms (Hoeppner et al., 2011), with members of marginalized populations (e.g., women, racial minorities, and low-income individuals) experiencing greater consequences of alcohol use, such as mental and physical health problems, at the same level of alcohol consumption as non-marginalized populations (CDC, 2016; Holmila & Raitasalo, 2005; Zemore et al., 2016). An advantage of considering alcohol use and alcohol use symptoms as distinct constructs is that it opens the possibility of identifying and intervening upon modifiable risk and protective factors that moderate the relationship between alcohol use and alcohol use symptoms to target the distress and impairment associated with alcohol use for members of marginalized populations, such as sexual minority women. Two plausible risk and protective factors, suppression and social support, are discussed in the next section.

Suppression and social support as moderators of the relationship between alcohol use and alcohol use symptoms. As noted in the previous section, identifying factors that strengthen or weaken the relationship between alcohol use and alcohol use symptoms among marginalized populations, including sexual minority women, may facilitate the development of interventions that reduce the distress and impairment associated with alcohol use. Only a small number of factors have been explored as potential moderators of the relationship between alcohol use and alcohol use symptoms. One important finding is that greater levels of suppression have been found to strengthen the relationship between volume of alcohol use and

alcohol use symptoms; greater levels of suppression were found to be associated with higher levels of alcohol use symptoms at the same volume of alcohol consumption (Norberg et al., 2016). No known research has specifically investigated the role of social support in moderating the relationship between alcohol use and alcohol use symptoms; however, the finding that being married (which has been identified as an aspect of social support; Ross, 1995; Sherbourne & Stewart, 1991) weakens the association between alcohol use and alcohol use symptoms for other marginalized groups, suggests that social support may be a plausible factor in moderating the relationship between alcohol use and alcohol use symptoms.

Social support functioning as both a mediator and a moderator. In this model social support functions as a mediator in the relationship between stigma-related stressors and depression and as moderator in the relationship between alcohol use and alcohol use symptoms. Mediators are characteristics of an individual that develop or become activated in response to an event or stressor, whereas moderators are characteristics prior to the event or stressor (Hatzenbuehler, 2009). The extant literature is inconsistent in its characterization of social support as a mediator or a moderator in the relationship between stigma and mental health outcomes. Though the Minority Stress Model (Meyer, 2013) conceptualizes social support as a moderator that weakens the relationship between stigma and mental health outcomes, the preponderance of research in this area conceptualizes social support as a mediator, wherein stigma contributes to reductions in social support which then increases risk for adverse mental health outcomes (Hatzenbuehler, 2009; Hatzenbuehler et al., 2009; Lehavot & Simoni, 2011). In defense of the Psychological Mediation Framework's conceptualization of social support as a mediator, Hatzenbuehler (2009) draws upon the distinction between mediators and moderators, emphasizing that in his conceptualization, social support is reduced in response to experiences of stigma-related stressors. Furthermore, Hatzenbuehler (2009) notes that his conceptual model seeks to gain a better understanding of the processes that explain the relationship between stigma-related stressors and mental health outcomes among sexual minorities, which requires analysis of mediation, not moderation. The experience of stigma-related stressors has the potential to increase or decrease the utilization of the proposed emotion regulation mechanisms, including social support (Hatzenbuehler, 2009). Considering the parallels between the Psychological Mediation Framework and the model proposed in this dissertation in terms of aims and structure, namely both models seek to explain the associations between stigma-related stressors and mental health outcomes through psychosocial mechanisms that may be activated or de-activated in response to stigma-related stressors, the reasoning advanced by Hatzenbuehler (2009) applies to the proposed model as well. Furthermore, though Hatzenbuehler's (2009) Psychological Mediation Framework is theoretical and has not been subject to empirical support, there exists empirical support for the conceptualization of social support as a mediator between stigma-related stressors and mental health outcomes. As noted above, the study by Hatzenbuehler and colleagues (2009) found social support to mediate the relationship between stigma-related stressors and psychological distress for both sexual minority and African American individuals, with experiences of stigma-related stressors predicting reductions in social support, which predicted greater psychological distress. Moreover, a model proposed by Logie and colleagues (2017) focused on the association between stigma-related stressors and depression symptoms among sexual minority women. This model proposed that a range of factors, including social support, mediate the relationship between stigma-related stressors and depression, finding support for the hypotheses that more experiences of stigma-related stressors

predicted less social support and less social support predicted a greater number of depression symptoms. Similarly, Lehavot and Simoni (2011) developed a model designed to understand the direct and indirect impacts of minority stress on mental health and substance use among sexual minority women. This model included a pathway through which social support mediated the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms, whereby more experiences of stigma-related stressors were hypothesized to predict lower levels of social support and lower levels of social support were hypothesized to predict depression symptoms and alcohol use symptoms; these hypotheses were supported.

That social support serves as a moderator in the relationship between alcohol use and alcohol use symptoms in this dissertation adds a level of complexity that warrants further clarification. It is worth noting that social support is not serving as a moderator between stigma-related and alcohol use symptoms, but rather as a moderator in the relationship between alcohol use and alcohol use symptoms, with higher levels of social support proposed to weaken the relationship between alcohol use and alcohol use symptoms. The aforementioned logic advanced by Hatzenbuehler (2009) helps to explain why social support serves as a moderator in the relationship between alcohol use and alcohol use symptoms. Because both social support and alcohol use are theorized to be associated with stigma-related stressors, level of social support is characterized as concurrent to alcohol use, rather than as being activated by alcohol use. Because of the concurrent nature of level of social support and level of alcohol use, social support serves a moderating function in the relationship between alcohol use and alcohol use symptoms rather than a mediating function. There is also some empirical support for this formulation. As noted above, Zemore and colleagues (2016) have found unmarried marital status, an aspect of social support, to strengthen the relationship between alcohol use and alcohol use symptoms.

Minority stress constructs as control variables. In addition to controlling for the demographic variables of race, ethnicity, and age, this study will also control for two proximal minority stress processes identified in both the Minority Stress Model (Meyer, 2013) and the model advanced by Lehavot and Simoni (2011): internalized homophobia and concealment. Unfortunately, other constructs in this model, such as expectations of rejection, could not be controlled for because they were not measured in the dataset used in this study. Because this model focuses on the relationship between stigma-related stressors and mental health outcomes, only a small subset of the mechanisms described by Meyer (2013) and Lehavot and Simoni (2011) are included in the model. However, controlling for internalized homophobia and concealment is important as greater levels of both have been linked to more experiences of stigma-related stressors and greater depression symptoms and alcohol use symptoms (Amadio, 2006; D'Augelli, Hershberger, & Pilkington, 1998; Igartua, Gill, & Montoro, 2003; Legate, Ryan, & Weinstein, 2012; Lehavot & Simoni, 2011), and if not included may confound the results of the model.

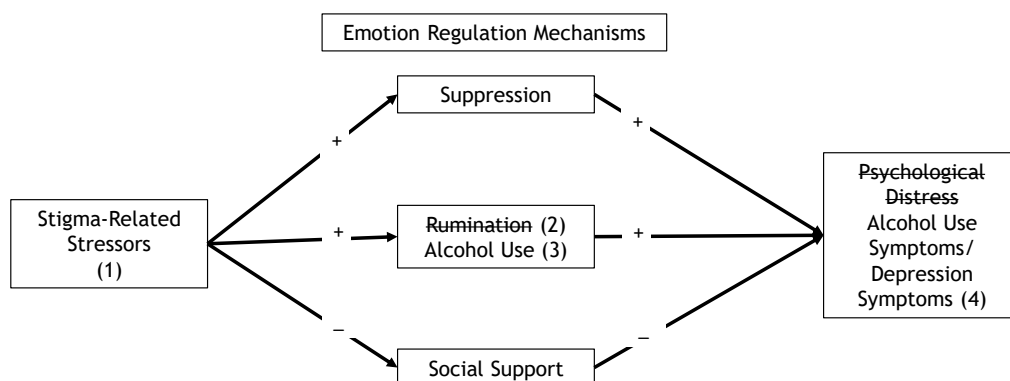
Summary of Modifications Made to Hatzenbuehler and Colleagues' (2009) Model

As described above, Hatzenbuehler and colleagues (2009) advanced a model whereby rumination, suppression, and social support mediated the relationship between stigma-related stressors and psychological distress. An adapted version of the model advanced by Hatzenbuehler and colleagues (2009) could potentially explain how stigma-related stressors may contribute to sexual minority women's higher rates of depression symptoms and alcohol use

symptoms. Such a model may be valuable for identifying treatment targets for sexual minority women living with co-occurring depression symptoms and alcohol use symptoms.

The primary adaptations to Hatzenbuehler and colleagues' (2009) model are: 1) a broader conceptualization of stigma; 2) the removal of rumination; 3) the addition of alcohol use as an emotion regulation mechanism; 4) the utilization of depression symptoms and alcohol use symptoms in place of the psychological distress measure (Positive and Negative Affect Schedule); 5) the utilization of social support and suppression as moderators that, at greater levels, weaken and strengthen, respectively, the relationship between alcohol use and alcohol use symptoms, and 6) the addition of an association between depression symptoms and alcohol use symptoms. The resulting model includes stigma-related stressors, the emotion regulation strategies of suppression, social support, and alcohol use, and the mental health outcomes of alcohol use symptoms and depression symptoms. These adaptations are depicted in Figure 3 and Table 1.

Figure 3. Proposed modifications to Hatzenbuehler and colleagues' (2009) model



Note: This figure depicts modifications 1-4 described in the preceding paragraph. Strikethrough notation describes removal from the model. Modifications 5 and 6 are not depicted in this figure, but the result is included in the final model which is depicted in Figure 2.

Table 1. Proposed modifications to Hatzenbuehler and colleagues' (2009) model

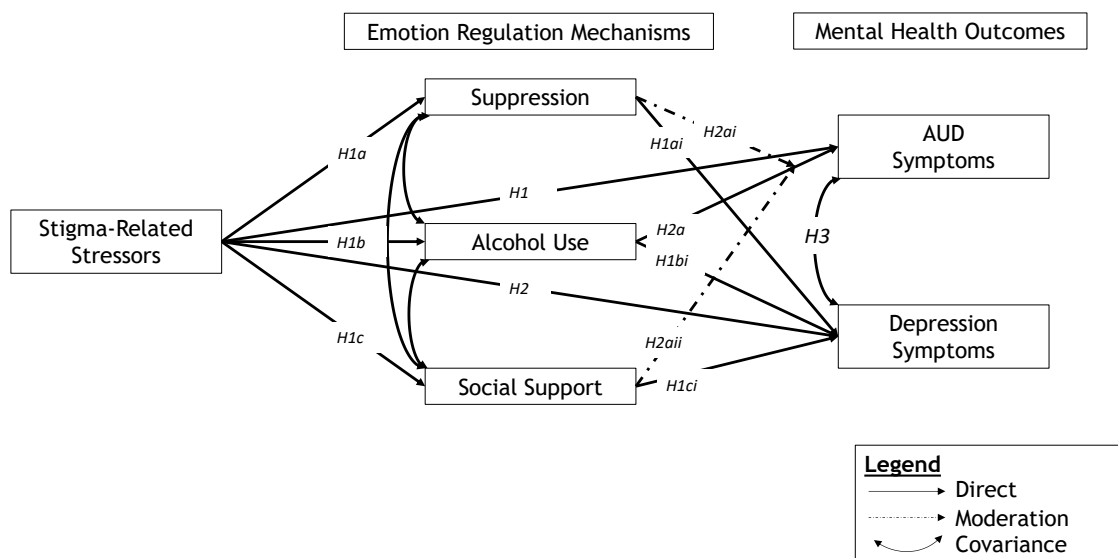
Modification	Justification
Broaden Stigma (1)	<ul style="list-style-type: none"> • Past research of depression symptoms and alcohol use symptoms among sexual minority women has utilized a broader conceptualization of stigma, including instances of stigma operating at both interpersonal and institutional levels and found experiences of this more general conceptualization of stigma to predict general mental health symptoms (Mays & Cochran, 2001)
Remove Rumination (2)	<ul style="list-style-type: none"> • Controversial status as emotion regulation mechanism. May instead serve a problem-solving function or be an unintended consequence of suppression (Gross & John, 2003; Moulds et al., 2007; Smith & Alloy, 2009)
Add Alcohol Use (3)	<ul style="list-style-type: none"> • Alcohol use is a common emotion regulation mechanism (Berking et al., 2011) • Alcohol use is a common response to stigma-related stressors for sexual minority women (Lehavot & Simoni, 2011) • Greater levels of alcohol use is associated with greater levels of depression symptoms and alcohol use symptoms (Boden & Fergusson, 2011; Schuckit & Hasselbrock, 2014)
Replace Psychological Distress with Depression symptoms and alcohol use symptoms (4)	<ul style="list-style-type: none"> • Similar constructs • More useful for informing evidence-based practices (APA, 2013)
Suppression and social support moderating the relationship between alcohol use and alcohol use symptoms (5)	<ul style="list-style-type: none"> • A range of psychosocial factors have been found to moderate the relationship between Alcohol Use and Alcohol Use Symptoms: Lower individual SES, greater prejudice and unfair treatment, and being unmarried were found to strengthen the relationship between alcohol consumption and consequences (Zemore et al., 2016) • Greater levels of suppression has been found to moderate the relationship between volume of alcohol use and alcohol use symptoms, predicting higher levels of alcohol use symptoms at the same volume of alcohol use (Norberg et al., 2016)
Association between depression symptoms and alcohol use symptoms (6)	<ul style="list-style-type: none"> • Greater levels of alcohol use symptoms have been found to be strongly associated with greater levels of depression symptoms (Berking et al., 2011) • Less is known about the co-occurrence of depression symptoms and alcohol use symptoms and better evidence-based practices are necessary for individuals with co-occurring depression symptoms and alcohol use symptoms (Boden & Fergusson, 2011; Burns, Teesson, & O'Neill, 2005)

Summary and Conclusion

This review finds precedent for the connections between stigma-related stressors, emotion regulation mechanisms, and mental health outcomes proposed in this dissertation. This chapter is intended to justify the construction of the proposed model by highlighting what is known about sexual orientation and gender disparities in model constructs and how model constructs relate to each other. This review generally supported the proposed model by identifying sexual minority women's elevated risk for many model constructs and past research that has empirically supported relationships between model constructs in the hypothesized directions. This chapter has also attempted to justify changes made to the model advanced by Hatzenbuehler and colleagues (2009) by identifying extant literature that supports the modifications made to the model. The result of this process is a model that advances the emotion regulation mechanisms of alcohol use, suppression, and social support as constructs that may help to explain the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms among sexual minority women.

Hypotheses

Figure 4. Hypothesized associations between stigma-related stressors, emotion regulation strategies, and mental health outcomes



Hypothesis *H1aii* can be visualized as a continuous line comprised of *H1a* and *H1ai*. Hypothesis *H1bii* can be visualized as a continuous line comprised of *H1b* and *H1bi*. Hypothesis *H1cii* can be visualized as a continuous line comprised of *H1c* and *H1ci*. *H2aiii* can be visualized as a continuous line comprised of *H1b* and *H2a*.

Based on the above synthesis of the literature, this study advances the following hypotheses:

H1. A greater number of stigma-related stressors will be associated with a greater number of depression symptoms.

H1a. A greater number of stigma-related stressors will be associated with higher levels of suppression.

H1ai. Higher levels of suppression will be associated with a greater number of depression symptoms.

H1aii. Higher levels of suppression will help to explain the relationship between stigma-related stressors and depression symptoms.

H1b. A greater number of stigma-related stressors will be associated with higher levels of alcohol use.

H1bi. Higher levels of alcohol use will be associated with a greater number of depression symptoms.

H1bii. Higher levels of alcohol use will help to explain the relationship between stigma-related stressors and depression symptoms.

H1c. A greater number of stigma-related stressors will be associated with lower levels of social support.

H1ci. Lower levels of social support will be associated with a greater number of depression symptoms.

H1cii. Lower levels of social support will help to explain the relationship between stigma-related stressors and depression symptoms.

H2. A greater number of stigma-related stressors will be associated with a greater number of alcohol use symptoms.

H2a. Higher levels of alcohol use will be associated with a greater number of alcohol use symptoms.

H2ai. Higher levels of suppression will strengthen the association between alcohol use and alcohol use symptoms.

H2aii. Higher levels of social support will weaken the association between alcohol use and alcohol use symptoms.

H2aiii. Higher levels of alcohol use will help to explain the relationship between stigma-related stressors and alcohol use symptoms.

H3. A greater number of depression symptoms will be associated with a greater number of alcohol use symptoms.

Chapter 3: Study Design/Methods

The study utilized a national, large-scale, cross-sectional, quantitative, online survey to gather information about the associations between stigma-related stressors, emotion regulation strategies (suppression, alcohol use, and social support), and mental health outcomes (depression symptoms and alcohol use symptoms).

Participant Recruitment and Inclusion/Exclusion Criteria

This study utilized data collected through the first wave of The PRIDE Study based at the University of California, San Francisco, which is a national, large-scale, longitudinal health study of adults who are at least 18 years old who identify as lesbian, gay, bisexual, transgender, queer, genderqueer or as another sexual or gender minority (PRIDE Study, 2019). All data utilized in The PRIDE Study are collected via an online survey that participants access through a portal on The PRIDE Study website.

Participants were recruited by The PRIDE Study through community partnerships, events, and online channels. The PRIDE Study reached out to centers and service providers oriented toward the LGBTQ community and encouraged these organizations to distribute recruitment materials to their constituents. Recruiters for The PRIDE Study also attended events (e.g., LGBTQ Pride events, conferences focused on LGBTQ issues) and distributed recruitment materials and directly enrolled participants. The PRIDE Study also engaged in targeted online recruitment (e.g., Facebook ads targeting individuals identifying as LGBTQ on their profiles).

For the study described in this dissertation, inclusion criteria were as follows: Participants must 1) identify as women; 2) identify as sexual minority (i.e., lesbian, bisexual, pansexual, same-gender loving or queer; and 3) be at least 18 years of age. Participants were excluded if they 1) identify as male, non-binary, or transgender; 2) identify as heterosexual, asexual, or questioning; 3) completed none of the model measure items, and 4) endorse diagnosis of a psychotic disorder

Human Subjects Procedures

The Institutional Review Board at the University of California, Berkeley was contacted to determine necessary human subjects review procedures. This study was deemed by the University of California, Berkeley Institutional Review Board to not require review, as the proposed methods were determined to not “meet the threshold definition of human subjects research set forth in Federal Regulations at 45 CFR 46.102(f).” The University of California, Berkeley Institutional Review Board reached this conclusion because this study utilizes non-identifiable, secondary data analysis, and the data was not obtained “... through intervention or interaction with the individual.”

Measures

To test the model described above, the study drew upon existing measures in The PRIDE Study questionnaire. Each measure utilized in this analysis is described below. For a list of measure items, please see Table 17 in Appendix A. For additional information about the

reliability, validity, scale, scoring, cut-off points, and past use with sexual minority women, please see Table 18 in Appendix A.

Mental health outcomes. *Alcohol use symptoms* were measured using the dependence and consequences subscales of the AUDIT (Babor et al., 2001). The full AUDIT is a validated 10-item scale of alcohol use and symptoms that asks about quantity, frequency, dependence symptoms, and consequences of alcohol use that closely resemble diagnostic criteria of alcohol use disorder in the Diagnostic and Statistical Manual. The full scale has a reliability of $\alpha = 0.83$ in past studies (Bohn, Babor, & Kranzler, 1995) and $\alpha = 0.80$ in the present study. The AUDIT is commonly used in research using samples of sexual minorities that includes sexual minority women (i.e., Grossman, D’Augelli, & Hershberger, 2000; Igartua et al., 2003; Weber, 2008).

The AUDIT is composed of three subscales: (1) quantity-frequency, (2) dependence, and (3) consequences. The reliability information for the frequency-duration subscale is described below. The dependence and consequences subscales will be used to measure *alcohol use symptoms* in this study. These two subscales were selected because they ask about dependence symptoms and consequences associated with alcohol use that closely resemble the symptoms of alcohol use disorder described in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013). No known reliability analyses have evaluated this subset of AUDIT items. The present study found that $\alpha = 0.75$ when these two scales were combined. The dependence subscale of the AUDIT is comprised of 3 questions that assess the presence of symptoms of alcohol dependence during the last year (e.g., “How often during the last year have you found that you were not able to stop drinking once you had started?”). Response options on the dependence subscale range from never (0) to daily or almost daily (4), resulting in a subscale with a maximum range of 0-12. The consequences scale of the AUDIT is comprised of 4 questions and assesses the presence of detrimental life experiences resulting from alcohol use during the last year (e.g., “How often during the last year have you been unable to remember what happened the night before because you had been drinking?”). Response options on the consequences subscale range from never (0) to daily or almost daily (4) or no (0) to yes, resulting in a scale with a maximum range of 0-16. The dependence and consequences subscales were combined into a total scale score (maximum range: 0-28) to assess *alcohol use symptoms*.

Depression symptoms were measured using the PHQ-9. The PHQ-9 is a validated 9-item measure of depression symptoms with response options ranging from not at all (0) to nearly every day (3), resulting in a scale with a maximum range of 0-27. Items directly assess the frequency of particular depression experiences in the past two weeks (e.g., “Over the last 2 weeks, how often have you been bothered by the following problem: Feeling down, depressed, or hopeless?”). Kroenke, Spitzer, and Williams (2001) found the reliability of the PHQ-9 to be $\alpha = 0.89$ and the present study found $\alpha = 0.87$. This scale was previously used with sexual minority women in a study of prevalence and correlates of mental health disorders among lesbian, gay, bisexual and queer young adults (Grant et al., 2014).

Stigma-related stressors. *Stigma-related stressors* were measured using the Experiences in Society questionnaire. The Experiences in Society questions includes 11 items about exposures to stressors with binary response options of no (0) or yes (1), resulting in a scale of 0-11. Items ask participants if they have ever experienced a broad array of stigma-related stressors, including harassment, housing discrimination, and sexual assault (e.g., “Have you ever experienced harassment or name calling from strangers in public?”). This measure was developed for The PRIDE Study and has not yet been validated. This measure is currently being

utilized in research projects affiliated with The PRIDE Study, though the results of these studies have not yet reached the phase of publication.

Emotion regulation strategies. *Suppression* was measured using the ERQ expressive suppression subscale. The ERQ is a validated 10-item scale of suppression comprised of two subscales (cognitive reappraisal and expressive suppression; Gross & John, 2003). Response options range from strongly disagree (1) to strongly agree (7), resulting in a scale with a range of 10-70. The cognitive reappraisal subscale consists of 6 items, resulting in a full subscale of 6-42, and the expressive suppression subscale consists of 4 items, resulting in a full subscale of 4-28. Items ask respondents about if they reframe their thinking (e.g., “When I want to feel less negative emotion, I change the way I’m thinking about the situation”) and if they avoid expressing negative emotions (e.g., “When I am feeling negative emotions, I make sure not to express them”). Because only the expressive suppression subscale is conceptualized as a suppression measure (the cognitive reappraisal is conceptualized as a measure of adaptive reframing), only the expressive suppression subscale was employed in this analysis (Gross & John, 2003). Though no known reliability statistics could be located, the ERQ has been found to have adequate construct and discriminant validity (Gross & John, 2003). The ERQ has been used in past research with sexual minority samples that include sexual minority women, including by Hatzenbuehler and colleagues (2009), in their validation of the model upon which the model proposed in this dissertation is based. The present study found $\alpha = 0.82$.

Social Support was measured using the emotional support subscale of PROMIS (PROMIS, 2018). PROMIS is a broad measure of well-being across a range of physical and mental health dimensions; the emotional support subscale is a 4-item scale about social support with response options ranging from never (1) to always (4), resulting in a scale of 4-16. Measure items ask about the availability of social support, with three of the four items asking about the availability of social support in the context of difficulty (e.g., “I have someone to confide in or talk to about myself or my problems”). No known research has validated this measure or employed this measure with a sample of sexual minority women. The present study found $\alpha = 0.93$.

Alcohol use was measured using the quantity-frequency subscale of the AUDIT. As noted above, the quantity-frequency subscale is one of three subscales in the AUDIT (information about the full scale is presented above). The AUDIT quantity-frequency subscale consists of three items asking about frequency and quantity of alcohol consumption, with response options ranging varying by item. The total subscale is on a scale of 0-12 and according to past research, has a reliability of $\alpha = 0.94$ (Meneses-Gaya et al., 2010). However, the current study found this subscale to have a reliability of only $\alpha = 0.61$. The AUDIT quantity-frequency subscale is commonly used in research using samples of sexual minorities that include sexual minority women (i.e., Cochran, Balsam, Flentje, Malte, & Simpson, 2013; E. Ross, Siegel, Dobinson, Epstein, & Steele, 2012; Kelly, Davis, & Schlesinger, 2015; Lea, Reynolds, & Wit, 2013)

Demographic variables. Demographic characteristics that have been linked to the mental health outcomes considered in this study were controlled for (Fredriksen-Goldsen, Kim, Barkan, Muraco, & Hoy-Ellis, 2013; Riolo, Nguyen, Greden, & King, 2005; Shilo & Savaya, 2012). *Psychosis* was measured by a single item from the questionnaire asking if participants have ever been diagnosed with schizophrenia or a psychotic disorder, with response option of yes or no. The remaining demographic information will be collected from single items on participants’ profiles in The PRIDE study portal. *Sex assigned at birth* was collected with a question

providing binary options of male and female. *Ethnicity* was collected through binary options of yes and no to the question of if the participant is Hispanic, Latino, or of Spanish origin. *Gender identity*, *sexual orientation*, and *race* were all based on questions with multiple options where participants can check all that apply that also include an open field where participants can freely enter alternative responses (see Table 17 in Appendix A for more information).

Proximal minority stress processes control variables. *Internalized homophobia* was controlled for in the model as it is a crucial minority stressor that has been linked to mental health symptoms among sexual minority populations (Meyer, 2003). Internalized homophobia was measured using the IHP-R, an abbreviated measure of internalized homophobia based on a longer measure developed for gay men. The abbreviated measure is comprised of five items, each scored on a scale from disagree strongly (1) to agree strongly (5), resulting in a scale of 5-25. Items ask about respondents' feelings and opinions about their sexual orientation (e.g., "I feel that being gay/lesbian/bisexual/sexual minority is a personal shortcoming for me"). The scale was found to have reliability of $\alpha = 0.82$ in a study of a social psychological framework for understanding sexual stigma among sexual minority individuals, including women (Herek, Gillis, & Cogan, 2009). The present study found $\alpha = 0.69$.

Concealment was also controlled for in the model as it is a crucial minority stressor that has been linked to mental health symptoms among sexual minority populations (Meyer, 2003). Concealment was measured using the concealment subscale of the Nebraska Outness Scale (NOS), a 12-item measure of outness comprised of two subscales, disclosure and concealment. The disclosure subscale focuses on how aware members of different domains of respondents' communities are of their sexual orientation, with response options ranging from 0% (no one; 10) to 100% (everyone; 0) (e.g., "What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? People at your work/school (for example, coworkers, supervisors, instructors, students)"). The concealment subscale focuses on the respondents' level of avoidance discussing sexual orientation-related issues, with response options ranging from never (0) to always (10) (e.g., "How often do you avoid talking about topics related to or otherwise indicating your sexual orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? People at your work/school (for example, coworkers, supervisors, instructors, students)."). The NOS is on a scale of 0-120, with each subscale being on a scale of 0-60. Because only concealment, not disclosure, is classified as a minority stressor in Minority Stress Theory (Meyer, 2013), and past research found concealment and disclosure to be distinct constructs with only concealment being associated with adverse mental health outcomes (Meidlinger & Hope, 2014), only the concealment subscale will be employed in this analysis. The NOS has good reliability ($\alpha = .89$) based on a study of sexual minority individuals, including sexual minority women (Meidlinger & Hope, 2014). The present study found $\alpha = 0.82$.

Data Analysis

Structural Equation Modeling (SEM) is a statistical approach that can be utilized to test the strength of multiple predictor and outcome variables simultaneously (Bowen & Guo, 2011) and SEM allows variables to operate as predictor and outcome variables simultaneously (Bowen & Guo, 2011). SEM is the appropriate analytic approach for the proposed study because this study aims to test a model featuring multiple predictor and outcome variables simultaneously whereby some variables, namely the emotion regulation mediators, operate as both predictor and outcome variables. SEM was utilized to determine: 1) if the number of stigma-related stressors is associated with the number of depression symptoms and alcohol use symptoms; 2) if those relationships are mediated by the hypothesized emotion regulation strategies; 3) if the relationship between alcohol use and alcohol use symptoms is moderated by suppression and social support, and 4) if the number of depression symptoms and alcohol use symptoms covary with each other. Stata (version 15.1) will be utilized for data cleaning and MPlus (version 8) will be utilized for running the proposed structural equation model.

Pre-specified analytic strategy. Latent variables will be defined in MPlus (version 8) for depression symptoms, alcohol use symptoms, suppression, social support, alcohol use, concealment, and internalized homophobia using the items from each of the described scales for these constructs. Data cleaning began by assessing amount and patterns of missingness. In alignment with the guidelines described by Harrington (2009), low levels of missingness were found (<10%) and Little's MCAR Test supported that data was missing completely at random ($X^2 = 26.6264$; $p = 0.484$; Nicholson, Deboeck, & Howard, 2017). Full information maximum likelihood was utilized to resolve missingness in model tests employing the Maximum Likelihood with Robust Standard Errors (MLR) estimator and pairwise deletion was utilized to resolve missingness in model tests employing the Weighted Least Squares Means and Variance (WLSMV) estimator. The `xwith` command was utilized to test the significance of latent interaction variables as predictors of Alcohol Use Symptoms; in model tests utilizing the `xwith` command, MLR was utilized as it is the only available estimator in MPlus that is compatible with the `xwith` command. For any post-hoc models not including the `xwith` command, the WLSMV estimator was used, as it is a more computationally efficient estimator for models with multi-dimensional measures using dichotomous indicators (as is the case with the stigma-related stressors measure; Hancock & Mueller, 2006). The `ind` command was utilized to test for mediation via a test of the indirect effect. The model controlled for internalized homophobia, concealment, race/ethnicity, and sexual minority identity.

The evaluation of model fit was based on the Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Fit Index (TFI), and comparative fit index (CFI). Model fit was assessed based on standard conventions of fit ($RMSEA \leq .06$; $CFI \geq .90$; $TFI \geq .90$; Harrington, 2009). To address poor model fit, the relationships with the lowest coefficients and highest p-values were removed in a stepwise fashion until the pre-specified fit standards were met. The modification indices provided by the software were consulted and modifications were considered based on if they would make a relatively large contribution to improving model fit and were substantiated by the extant literature.

All of the study hypotheses were evaluated based on the results of significance tests for relationship between variables, using a 5% level of significance. For this study, alcohol use, suppression, and social support were all classified as emotion regulation mechanisms and

depression symptoms and alcohol use symptoms are classified as mental health outcomes. Hypotheses *H1* and *H2*, which hypothesize that stigma-related stressors will predict mental health outcomes, were evaluated based on direct effects, namely a significant association between the predictor variable (stigma-related stressors) and the respective mental health outcome variable. Hypotheses *H1aii*, *H1bii*, *H1cii*, and *H2aiii* which hypothesize that the emotion regulation mechanisms of suppression, alcohol use and social support will mediate the relationship between stigma-related stressors and mental health outcomes, were evaluated based on whether the specific indirect effects for each respective emotion regulation mechanism and respective mental health outcome emerge as significant in the relationship between stigma-related stressors and mental health outcomes. Hypotheses *H1a*, *H1b*, *H1c*, *H1ai*, *H1bi*, *H1ci*, and *H2a*, which hypothesize that stigma-related stressors predict emotion regulation mechanisms or emotion regulation mechanisms predict mental health outcomes, were evaluated based on whether the relationship between stigma-related stressors and the proposed emotion regulation mechanism or the relationship between the proposed emotion regulation mechanism and mental health outcome emerged as significant. Hypotheses *H2ai* and *H2aii*, which specify that the emotion regulation mechanisms of suppression and social support will moderate the relationship between alcohol use and alcohol use symptoms, were evaluated based on the significance of the respective interaction terms as predictors of alcohol use symptoms. Hypothesis *H3*, which states that depression symptoms and alcohol use symptoms will be associated, was evaluated based on if the covariance of the number of depression symptoms and alcohol use symptoms is significant. Because the covariance coefficient and corresponding p-value of the relationship between depression symptoms and alcohol use symptoms provided in the full model is the residual covariance after all model constructs are considered, the relationship between depression symptoms and alcohol use symptoms will instead be evaluated based on the coefficient of the covariance and corresponding p-value of the relationship between depression symptoms and alcohol use symptoms in a reduced version of the model that exclusively considers the covariance of depression symptoms and alcohol use symptoms, controlling for race, sexual orientation, internalized homophobia, and concealment. All provided coefficient estimates are standardized.

Additional diagnostics and corrections. Three challenges emerged in fitting the model. The first challenge is that the only approach for modeling moderation of latent variable relationships in MPlus 8 (the *xwith* command) does not permit the estimation of fit statistics or direct and indirect effects, as neither have yet been developed in the literature for the *xwith* command (Muthen, 2008). To approximate these estimates, the model was run using observed variable emotion regulation mechanisms. The second challenge is that limited functionality in MPlus (version 8) precludes simultaneous analysis of models including both categorical variables (such as the stigma-related stressors variables in this model) and moderation using latent variables (as is the case with the analysis of social support and suppression moderating the relationship between alcohol use and alcohol use symptoms). The *xwith* command for modeling moderation effects can only be employed with the maximum likelihood with robust standard errors (MLR) estimator for continuous response variables; whereas WLSMV is the appropriate estimator for categorical variables. Despite the limitation in fitting the stigma-related stressors items, an initial effort was made to fit the model using MLR, which resulted in an additional challenge: The model failed to converge.

Several steps were taken to improve model fit and achieve convergence. A confirmatory factor analysis was performed on each measure and for each measure, some items were allowed to covary based on modification indices. Since the stigma-related stressors measure had not previously been validated, additional steps were taken in the construction of this measure. An exploratory factor analysis was performed, which identified a three-factor solution (violence, service discrimination, healthcare discrimination). The harassment item was dropped due to low factor loadings on any of the three factors. The model was rebuilt with the stepwise addition of the remaining terms included in the full model. Even after specifying starting values, it was not possible to achieve model convergence in any model that included a latent interaction term for alcohol use and suppression. Thus, a separate model using an observed interaction term of alcohol use and suppression was utilized to test suppression as a moderator of the relationship between alcohol use and alcohol use symptoms. Neither suppression nor the interaction term significantly predicted alcohol use symptoms, so this portion of the analysis was not pursued any further. The complete model, with the exception of suppression and the interaction of suppression and alcohol use, was run using MLR. This model successfully converged. Neither social support nor the interaction term significantly predicted alcohol use symptoms. To achieve greater computational efficiency, social support and the interaction term were removed from the model, and the model was rerun using WLSMV. Notably, changing the estimator did not have an effect on the significance of any of the model relationships. For reasons expanded upon in the results section, namely the model not predicting alcohol use symptoms well, a post-hoc model of depression was constructed and evaluated based on the results of the initial model.

Additional analyses. There is often ambiguity about whether an adverse experience is stigma-related or not (for example, an individual may not receive a job offer for reasons of heterosexist discrimination or because there is another more qualified candidate) and the extant literature has not reached a consensus about whether experiences need to be classified by the target as stigma-related for the stressor to be considered stigma-related stressors. Because stressors can contribute to cognitive burden as targets attempt to make attributions about them (such as appraising whether the event was due to stigma), even if the final conclusion is that the stressor was not due to stigma (Clark, Anderson, Clark, & Williams, 1999; Huynh, 2012; Major, Quinton, & McCoy, 2002) and depression may contribute to targets making stigma-based attributions which could confound a finding of stigma-related stressors predicting depression (Major et al., 2002) this study will classify all endorsed stressors as stigma-related stressors. Because there does not exist a consensus in the literature about this decision, the analysis was run both with all stressors classified as stigma-related as well as with only the stressors identified by the target as stigma-related, and the approach to measuring stigma did not affect the significance of any relationships between model constructs.

Chapter 4: Results

Two stages of analysis occurred. The first attempted to validate the proposed model of co-occurring depression symptoms and alcohol use symptoms. As described below, the lack of significant associations with alcohol use symptoms resulted in a model that does not well explain co-occurring depression symptoms and alcohol use symptoms among sexual minority women. However, the model identified factors associated with depression symptoms. Thus, a post-hoc model testing associations with only depression symptoms was proposed and validated. Focusing just on depression allows for the identification of intervention strategies that can target the mechanisms that were identified as being significantly associated with depression.

Descriptive Results

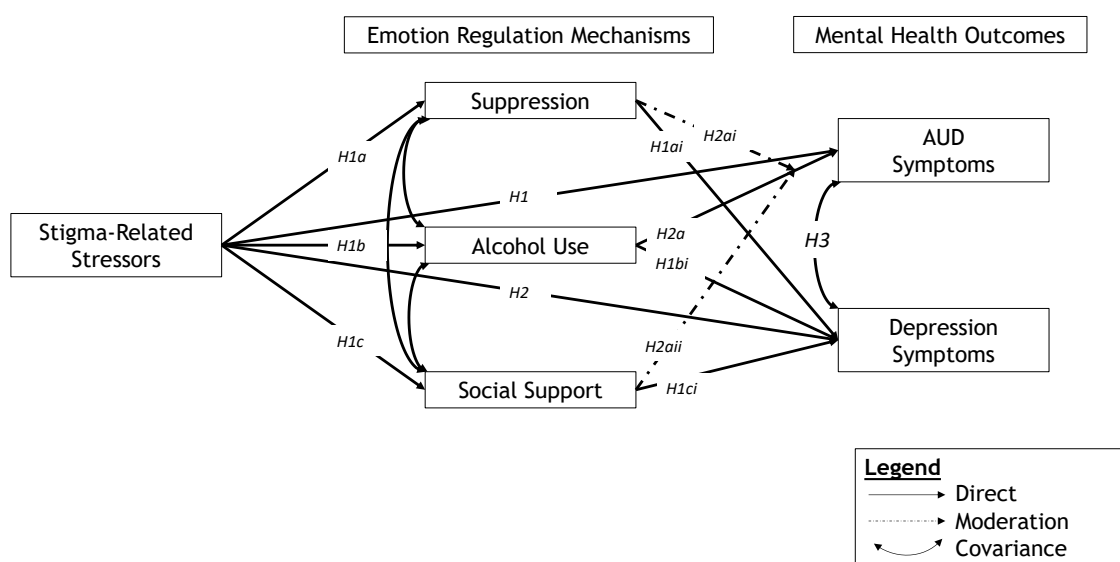
In total, 1,773 participants met inclusion criteria for this study. Descriptive statistics about sexual orientation and race/ethnicity can be found in Tables 19 and 20 and descriptive statistics about emotion regulation mechanisms, mental health outcomes, and stigma-related stressors can be found in Graphs 1-5 in Appendix B. Because missingness for all items was below 10% and Little's MCAR Test supported that data was missing completely at random ($X^2 = 26.6264$; $p = 0.484$; Nicholson, Deboeck, & Howard, 2017), pairwise deletion was employed.

Initial Model Results

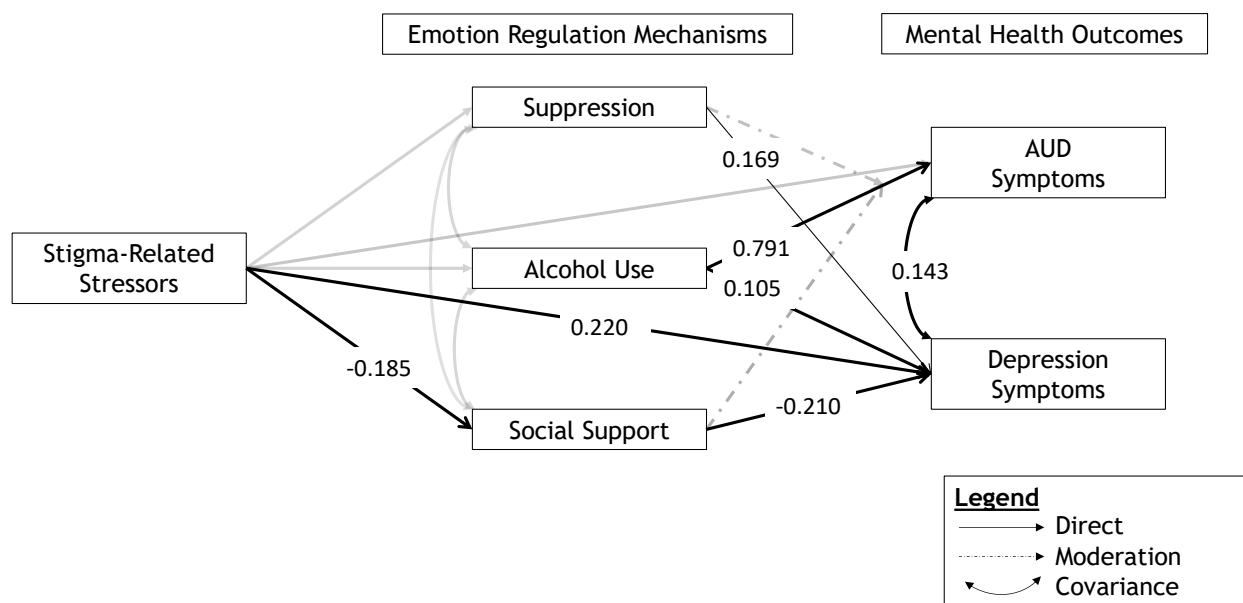
In the initial model, fit statistics did not satisfy the conventional standards described above (RMSEA = 0.089; CI: 0.077-0.080; CFI = 0.649; TLI = 0.612). One approach for modifying a model to improve overall model fit is to consult the parameter estimates for individual relationships to identify non-significant relationships that may be contributing to poor model fit (Kelloway, 2015). Since the estimates for the coefficients of suppression and the interaction of alcohol use and suppression as factors associated with alcohol use symptoms were the lowest and corresponded with the highest p-values, they were removed from the model. The model was re-run with the removed relationships. All fit statistics exceeded the established standards described in the Methods chapter (see Table 2). As hypothesized, stigma-related stressors ($H1$; standardized coefficient estimate, $\beta = 0.220$; $p < 0.001$), suppression ($H1ai$; $\beta = 0.169$; $p < 0.001$), alcohol use ($H1b$; $\beta = 0.105$; $p < 0.001$), and social support ($H1ci$; $\beta = -.210$; $p < 0.001$) were all significantly associated with depression. Also, as hypothesized, alcohol use ($H2a$; $\beta = 0.790$; $p < 0.001$) was significantly associated with alcohol use symptoms, but contrary to hypothesis and previous research, stigma-related stressors were not significantly associated with alcohol use symptoms ($H2$), nor was the relationship between alcohol use and alcohol use symptoms significantly strengthened by suppression ($H2ai$) or weakened by social support ($H2aii$). As hypothesized, stigma-related stressors were associated with social support ($H1c$; $\beta = -0.185$; $p < 0.001$), but contrary to hypothesis, stigma-related stressors were not significantly associated with suppression ($H1a$) or alcohol use ($H1b$). As hypothesized, social support appears to mediate the relationship between stigma-related stressors and depression (with a greater number of stigma-related stressors being associated with lower levels of social support which were associated with a greater number of depression symptoms; $H1cii$; $\beta = 0.055$; $p < 0.001$), but contrary to hypotheses, there was no evidence that either suppression ($H1aii$) or

alcohol use (*H1bii*) mediates the relationship between stigma-related stressors and depression symptoms. Nor was there any evidence that alcohol use mediates the relationship between stigma-related stressors and alcohol use symptoms (*H2aiii*). These results are described in Tables 2 to 9 and depicted in Figure 5. Lastly, as hypothesized, a greater number of alcohol use symptoms was associated with a greater number of depression symptoms (*H3*; $\beta = 0.143$; $p < 0.001$).

Figure 4. Hypothesized associations between stigma-related stressors, emotion regulation strategies, and mental health outcomes (re-presented)



Hypothesis *H1aii* can be visualized as a continuous line comprised of *H1a* and *H1ai*. Hypothesis *H1bii* can be visualized as a continuous line comprised of *H1b* and *H1bi*. Hypothesis *H1cii* can be visualized as a continuous line comprised of *H1c* and *H1ci*. *H2aiii* can be visualized as a continuous line comprised of *H1b* and *H2a*.

Figure 5. Significant results of full model

*Significant relationships ($p < .01$) are indicated by darkened lines and are labeled with beta coefficients.

Table 2. Fit statistics*

Fit Statistic	Coefficient	P-Value/ 90% Confidence Interval
Chi-Square Test of Model Fit	1530.897	<0.001
RMSEA	0.025	0.023-0.026
CFI	0.960	NA
TLI	0.956	NA

Notes: *As described in the Methods chapter, these fit statistics are based on a model utilizing observed variables for the emotion regulation mechanisms included in the model. **Control variables included: internalized homophobia, concealment, race, and sexual orientation.

Table 3. Associations with depression symptoms**

Hypothesis	Variable	Std. Coefficient	Std. Error	P-Value
<i>H1</i>	Stigma*	0.220	0.041	<0.001
<i>H1ai</i>	Suppression*	0.169	0.030	<0.001
<i>H1bi</i>	Alcohol Use*	0.105	0.028	<0.001
<i>H1ci</i>	Social Support*	-0.210	0.034	<0.001

Notes: **Model Controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 4. Associations with alcohol use symptoms**

Hypotheses	Variable	Std. Coefficient	Std. Error	P-Value
<i>H2</i>	Stigma	0.051	0.027	0.053
<i>H2a</i>	Alcohol Use*	0.791	0.030	<0.001
<i>H2ai</i>	Alcohol Use × Suppression***	-0.001	0.001	0.351
<i>H2aii</i>	Alcohol Use × Social Support*	-0.062	0.097	<0.001
<i>NA</i>	Suppression***	0.001	0.003	0.737
<i>NA</i>	Social Support	-0.028	0.043	0.515

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.
***Coefficient estimated through alternative model (see Methods for description of procedure).

Table 5. Association with suppression**

Hypothesis	Variable	Std. Coefficient	Std. Error	P-Value
<i>H1a</i>	Stigma	-0.004	0.034	0.909

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 6. Association with alcohol use**

Hypothesis	Variable	Std. Coefficient	Std. Error	P-Value
<i>H1b</i>	Stigma	-0.049	0.035	0.053

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 7. Association with social support**

Hypothesis	Variable	Std. Coefficient	Std. Error	P-Value
<i>H1c</i>	Stigma*	-0.185	0.034	<0.001

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 8. Direct and indirect effects for depression symptoms**

Effect Type	Hypothesis	Variable	Std. Coefficient	Std. Error	P-Value
Total*			0.278	0.039	<0.001
Total Direct*			0.228	0.040	<0.001
Total Indirect*			0.051	0.011	<0.001
Specific Indirect	<i>H1aii</i>	Suppression	-0.002	0.005	0.689
	<i>H1bii</i>	Alcohol Use	-0.002	0.002	0.289
	<i>H1cii</i>	Social Support*	0.055	0.010	<0.001

Notes: **As described in the Methods chapter, these estimates are based on a model utilizing observed variables for the emotion regulation mechanisms included in the model. ***Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 9. Direct and indirect effects for alcohol use symptoms**

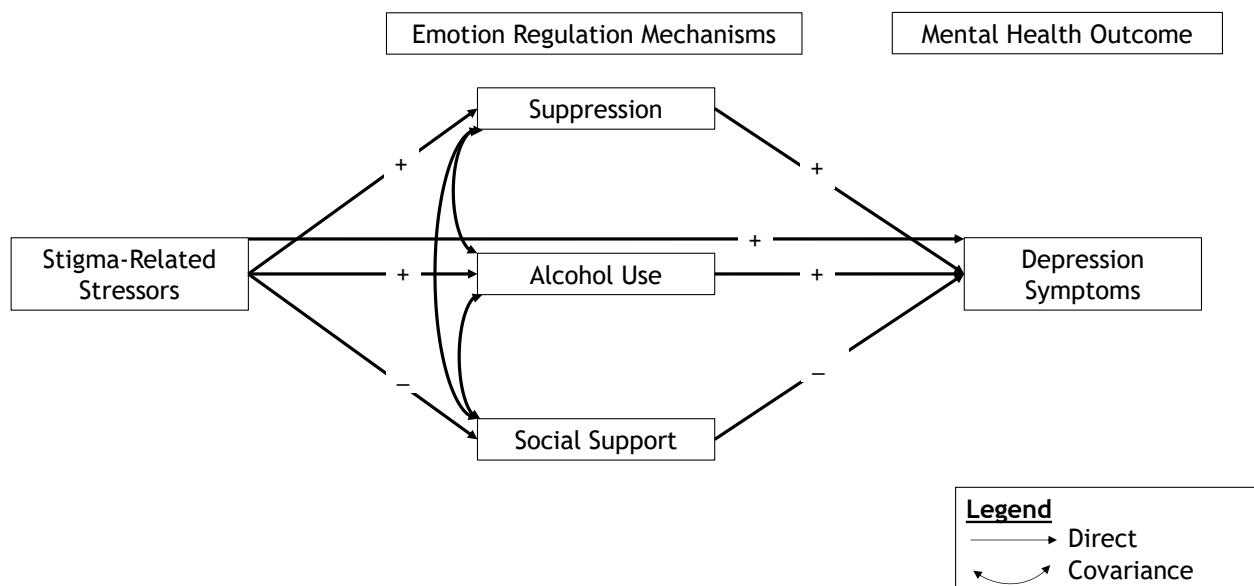
Effect Type	Hypothesis	Variable	Std. Coefficient	Std. Error	P-Value
Total			-0.009	0.039	0.825
Total Direct			0.041	0.026	0.109
Total Indirect			-0.050	0.034	0.144
Specific Indirect	<i>H2ai</i>	Alcohol Use	-0.042	0.030	0.163
	<i>NA</i>	Suppression***	0.00	0.002	0.970
	<i>NA</i>	Social Support	-0.008	0.012	0.526

Notes: **As described in the Methods chapter, these estimates are based on a model utilizing observed variables for the emotion regulation mechanisms included in the model. ***Coefficient included for reference. Coefficient was estimated in the initial poorly fitting model and was removed from subsequent analysis. ****Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Post-Hoc Depression Model Results

As described in the previous section, while all of the hypothesized variables were significantly associated with depression symptoms in the hypothesized direction, none of the hypothesized variables, except alcohol use, were significantly associated with alcohol use symptoms. These findings suggest that the variables in the model are more associated with depression symptoms rather than co-occurring depression symptoms and alcohol use symptoms. Thus, the author proposes a simplified model of depression symptoms. This modified model is depicted in Figure 6.

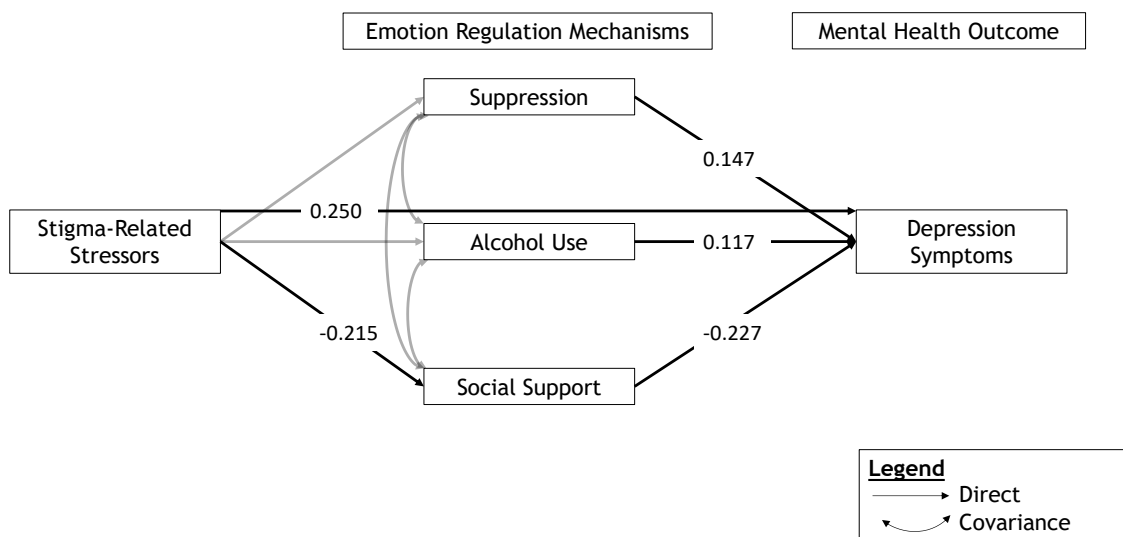
Figure 6. Proposed model of associations between stigma-related stressors, emotion regulation strategies, and depression



The results of the post-hoc depression model closely resemble the results of the previous analysis. All fit statistics exceed the established standards described in the Methods chapter. As hypothesized, social support ($\beta = -0.227$; $p < 0.001$), alcohol use ($\beta = 0.117$; $p < 0.001$), suppression ($\beta = 0.147$; $p < 0.001$), and stigma-related stressors ($\beta = 0.250$; $p < 0.001$) were all significantly associated with depression symptoms. As hypothesized, stigma-related stressors were associated social support ($\beta = -0.215$; $p < 0.001$), but contrary to hypothesis, stigma-related stressors were not significantly associated with alcohol use or suppression. As hypothesized, social support appears to mediated the relationship between stigma-related stressors and depression, with a higher number of stigma-related stressors being associated with lower levels of social support which was associated with greater levels of depression symptoms (indirect

effect estimate $\beta = 0.049$; $p < 0.001$), but contrary to hypotheses, none of the other specific indirect effects were significant. These results are described in Tables 11-15 and depicted in

Figure 7. Significant results of depression model



*Significant relationships ($p < .01$) are indicated by darkened lines and are labeled with beta coefficients.

Figure 7.

Table 10. Fit statistics**

Fit Statistic	Coefficient	P-Value/90% Confidence Interval
Chi-Square Test of Model Fit	1844.389	<0.001
RMSEA	0.029	0.027-0.031
CFI	0.914	NA
TLI	0.905	NA

Note: **Model controls for internalized homophobia, concealment, race, and sexual orientation

Table 11. Associations with depression symptoms**

Variable	Std. Coefficient	Std. Error	P-Value
Social Support*	-0.227	0.024	<0.001
Alcohol Use*	0.117	0.026	<0.001
Suppression*	0.147	0.024	<0.001
Stigma*	0.250	0.034	<0.001

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 12. Association with social support**

Variable	Std. Coefficient	Std. Error	P-Value
Stigma*	-0.215	0.032	<0.001

Note: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 13. Association with alcohol use**

Variable	Std. Coefficient	Std. Error	P-Value
Stigma	-0.035	0.035	0.322

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 14: Association with suppression**

Variable	Std. Coefficient	Std. Error	P-Value
Stigma	0.016	0.030	0.601

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Table 15: Direct and indirect effects for depression symptoms**

Effect Type	Variable	Std. Coefficient	Std. Error	P-Value
Total*		0.297	0.033	<0.001
Total Direct*		0.250	0.034	<0.001
Total Indirect*		0.047	0.011	<0.001
Specific Indirect	Social Support*	0.049	0.009	<0.001
	Alcohol Use	-0.004	0.004	0.350
	Suppression	0.002	0.004	0.598

Notes: **Model controls for internalized homophobia, concealment, race, and sexual orientation. * $p < .01$.

Chapter 5: Discussion

This dissertation has tested a model of co-occurring depression symptoms and alcohol use symptoms, whereby social support, alcohol use, and suppression were considered as mechanisms through which stigma-related stressors may be associated with the mental health outcomes of depression symptoms and alcohol use symptoms. Because none of the hypotheses pertaining to associations with alcohol use symptoms, aside from the association with alcohol use, were supported, whereas most of the hypotheses pertaining to associations with depression were supported, a reduced model that focuses on depression symptoms was developed and evaluated. The findings from this post-hoc model make a valuable contribution to the literature because little is known about factors associated with sexual minority women's experiences of depression symptoms and the mechanisms through which stigma may lead to these symptoms. This discussion will begin with a deeper explanation of the primary findings and novel contributions to the literature as well as the limitations and strengths of the current study. To leverage the value of these findings for intervention, this section will then provide a general overview of implications for intervention for depression symptoms and then delve into more specific evidence-based interventions that may be utilized to intervene upon depression for this vulnerable population. Lastly, future directions for explanatory and intervention models of alcohol use symptom and depression symptom disparities will be proposed.

Primary Findings

Our findings from both the full model and post-hoc model make important contributions to the literature, both in terms of identifying factors that may help explain sexual minority women's increased risk of depression symptoms and alcohol use symptoms and identifying a mechanism, social support, that may help explain the relationship between stigma-related stressors and depression symptoms. First, while little is presently known about the factors that may explain sexual minority women's increased rates of depression symptoms and alcohol use symptoms, we found that greater numbers of stigma-related stressors (*H1*), higher levels of suppression (*H1ai*), higher levels of alcohol use (*H1bi*), and lower levels of social support (*H1ci*), were all associated with a greater number of depression symptoms. Second, while little is presently known about the mechanisms through which stigma may predict depression symptoms, we have identified social support as a mechanism that helps to explain this relationship, in the proposed direction (*H1cii*). However, higher levels of suppression (*H2ai*) and higher levels of social support (*H2aii*) do not appear to strengthen or weaken, respectively, the association between level of alcohol use and number of alcohol use symptoms.

The findings of this study depart from the literature in several important ways. Firstly, contrary to past research (Hatzenbuehler et al., 2009; Heffernan, 1998; McKirnan & Peterson, 1988), stigma-related stressors was not associated with suppression (*H1a*), alcohol use (*H1b*), or alcohol use symptoms (*H2*). One possible explanation for this finding is that these past studies do not generalize to sexual minority women. Another possibility is important differences in how constructs were operationalized and measured across the current and past studies. For instance, Hatzenbuehler and colleagues (2009) had employed a different approach than the current study in testing the association between stigma-related stressors and suppression. The current study tested the association between the overall number of types of stigma-related stressors the

participant had experienced and their level of suppression; whereas, the study by Hatzenbuehler and colleagues (2009) tested whether participants reported more suppression on days when they had experienced a stigma-related stressor than on days when they had not. This difference in measurement could explain these divergent findings. It is possible that there may be differences in these relationships for this population when compared to the general population. Another possibility is that the current stigma-related stressors measure may not have properly captured the experiences of stigma-related stressors for this population. These explanations may also help to explain the lack of mediation between stigma-related stressors and the mental health outcomes. In the absence of a direct effect from stigma-related stressors to suppression, alcohol use, and alcohol use symptoms, significant mediation effects are improbable. However, though Hatzenbuehler and colleagues (2009) had found stigma-related stressors to predict suppression, they also did not find suppression to mediate the relationship between stigma-related stressors and their mental health outcome. This may suggest that suppression does not serve to mediate the relationship between stigma-related stressors and mental health outcomes.

Secondly, the present study did not find support for higher levels of suppression (*H2ai*) and social support (*H2a_{ii}*) strengthening or weakening, respectively, the association between the level of alcohol use and the number of alcohol use symptoms. The identification of factors that strengthen or weaken the relationship between alcohol use and alcohol use symptoms is a severely underdeveloped area of the literature. It is also a particularly critical area of research, given that it may provide insight into mechanisms, in addition to level of alcohol use, that may be targeted to reduce alcohol use symptoms. Though this study drew on the research of Zemore and colleagues (2016) and Norberg and colleagues (2016), to inform its hypotheses of the moderating effects of suppression and social support on the relationship between alcohol use and alcohol use symptoms, the lack of support for these hypotheses do not directly contradict the extant literature, because neither of these previous studies had explored how these particular mechanisms may influence the relationship between alcohol use and alcohol use symptoms among sexual minority women. One possible explanation for the lack of support for the moderating effects of suppression and social support is that the moderately high correlation between alcohol use and alcohol use symptoms ($\text{correl} = 0.62$) reduced the likelihood of finding a significant moderating effect of that that relationship.

Limitations

This study is not without limitations, including limitations due to shortcomings and inconsistencies in the extant literature, analytic approaches employed in the study, and sample characteristics and consideration of important axes of identity. Though this model was constructed through a careful review of the relevant literature, the extant literature did not always present a clear and consistent picture about the best way for constructing the model. For instance, there is ambiguity about the causal directions of relationships between constructs of the model, such as the inconsistencies in the literature about the direction of causal relationships (e.g., several studies cited in this dissertation suggest that alcohol use may cause depression; Rehm et al., 2003, whereas other research has found that this relationship may be bi-directional; Gilman & Abraham, 2001). These ambiguities are exacerbated by the facts that most of the studies used to justify the construction of this model utilized cross-sectional data and that not all configurations of the model constructs have been evaluated for sexual minority women. Though

this model takes an important step in testing relationships that do not appear to have been previously tested for sexual minority women (e.g., the relationship between suppression and alcohol use; Williams & Hasking, 2010), this study has not tested plausible alternative model configurations.

This study includes several limitations related to the analytic approaches. First, this study utilized cross-sectional data which precludes the time ordering of constructs, such as whether the stigma-related stressors occurred prior to mental health outcomes, limiting the ability for causal inference (Fergusson et al., 2009). Second, the stigma-related stressors measure has not been previously validated on any sample. Though a confirmatory factor analysis of the measure, as constructed, shows good fit with the data, the measure has not been subjected to a full range of validation procedures (e.g., testing for convergent and divergent validity). Third, the measures included in the model are often focused on the general use of emotion regulation strategies, rather than use of these strategies in response to stigma related stressors. For instance, one item of the ERQ asks “I control my emotions by not expressing them” rather than asking the more specific question “I control my emotions about experiences of stigma by not expressing them.” Due to this subtle difference, items such as this may have captured emotion regulation strategies in response to more general events rather than specifically capturing emotion regulation strategies in response to stigma-related stressors. Fourth, the model proposed by Hatzenbuehler and colleagues (2009) and the present study focused on suppression as defined as the inhibition of the expression of emotions (expressive suppression). Though expressive suppression is one facet of suppression, the construct of suppression also includes emotion suppression (i.e., actively attempting to avoid experiencing particular emotions) and thought suppression (i.e., actively attempting to avoid experiencing particular thoughts; Hayes & Feldman, 2004; Wegner & Zanakos, 1994), and the current study did not capture these other facets of this construct. Women may actually engage in lower levels of expressive suppression (Kring & Gordon, 1998) but higher levels of thought suppression (Hayes & Feldman, 2004; Wegner & Zanakos, 1994) than men. Results have been mixed on gender differences in emotion suppression, with one study suggesting women may engage in higher rates of emotion suppression (Hayes & Feldman, 2004) and another study suggesting women may engage in lower rates of emotion suppression (Flynn, Hollenstein, & Mackey, 2010). Fifth, though some important minority stress processes were controlled for (internalized homophobia and concealment), it was not possible to control for every relevant model construct with the current dataset (e.g., expectation of rejection, general stressors). Lastly, the complexity of this model, namely the inclusion of moderated mediation and both categorical and continuous variables, and challenges with convergence, necessitated the use of multiple modeling approaches. As described in greater detail in the methods section, this required combining the results of multiple analyses to evaluate model fit, which is not standard practice for conducting these analyses. However, given the similarities in coefficients and significance tests across these two models, the authors believe the models were sufficiently similar to one another that such comparisons were appropriate.

This study also includes several limitations pertaining to sample characteristics and consideration of axes of identity. Firstly, this sample is less racially diverse than the general United States population. Whereas 95% of this sampled identified as White, only 77% of the United States population identifies as White (Census Bureau, 2017). Although this study controlled for race/ethnicity, it did not test for different model fit across racial and ethnic groups. This is an important consideration because past research has found differences in some of the

model constructs across racial and ethnic groups. For instance, Black, Asian and Latino/a/x individuals have significantly lower rates of alcohol abuse and depression than their non-Latino/a/x White counterparts (Smith et al., 2006). Black and Latino/a/x individuals were found to have higher levels of social support than non-Latino/a/x White individuals, which appeared to mediate the relationship between race/ethnicity and depression (Putnam-Hornstein, Needell, King, & Johnson-Motoyama, 2013). Furthermore, the study by Zemore and colleagues (2016) that served to motivate the hypotheses about factors that may moderate the relationship between alcohol use and alcohol use symptoms found moderating effects for Black and Latino respondents but not for White respondents. This suggests that these hypotheses may be more likely to be significant for Black and Latina respondents than for their White counterparts. Secondly, although this study controlled for sexual minority identity, it did not test for different model fits across sexual orientation groups (e.g., lesbian vs. bisexual). This is an important shortcoming because past research has found that some model constructs, such as social support and alcohol use symptoms vary across sexual minority identity groups (Fredriksen-Goldsen et al., 2013; Shilo & Savaya, 2012). Lastly, this study did not include the experiences of transgender women. This was an intentional decision based on several factors. Firstly, none of the literature used to justify the construction of this model discussed whether their samples included transgender women or were generalizable to transgender women. Secondly, this model controlled for several sexual minority-specific minority stress factors (i.e., internalized homophobia and sexual orientation concealment) but not for gender identity-specific minority stress factors. Taken together, these limitations leave uncertainty about the applicability of these findings to transgender women.

Future Directions for Research

This study takes an important step in filling gaps in the literature around mechanisms through which stigma-related stressors may lead to disparities in depression symptoms and alcohol use symptoms among sexual minority women. This study is among the first to use a large-scale, national data set of sexual and gender minority individuals, addressing a common critique of prior sexual minority research (Meyer & Wilson, 2009). Furthermore, because this was a survey designed to study sexual minority populations, it has more robust measures of sexual orientation and minority stress variables than most largescale datasets, allowing for the use of more rigorous control variables (e.g., internalized homophobia, concealment, and sexual minority identities). Relatedly, the mental health outcome and emotion regulation mechanism measures are all previously validated measures, many of which have been validated with samples of sexual minority individuals (see Table 18 in Appendix A); the use of validated measures improves confidence in the quality of these findings. Lastly, because this study emphasized emotion regulation mechanisms that are amenable to existing evidence-based practices, it has clear implications for clinical interventions, which are discussed below.

As with any study, the findings of this study should be subject to replication. These replication efforts should address some of the limitations of the current study. Because this study made use of the first, and presently only extant, wave of a longitudinal dataset, it was limited by utilizing cross-sectional data. However, as future waves become available, it will be possible to replicate this analysis with multiple waves of data, allowing for time ordering of constructs, which will bolster the ability to make causal inference from the data. In their evaluation of the

model upon which the model proposed in this dissertation is based, Hatzenbuehler and colleagues (2009) used a daily diary approach, whereby each day respondents reported their experiences of stigma and use of emotion regulation strategies through completing standardized assessment tools. In their analysis, Hatzenbuehler and colleagues (2009) compared levels of each emotion regulation strategy on days when respondents had experienced stigma to days when they had not. Focusing on this briefer time interval improves the likelihood that variation in stigma is related to variation in emotion regulation mechanisms. Efforts to replicate this model should make use of the daily diary approach to bolster confidence in the relationship between stigma and emotion regulation mechanisms.

Efforts to replicate this model should also make use of more precise and validated measures. As noted above, the stigma-related stressors measure employed in this study has not been previously validated; although the other measures have been previously validated, often in samples of sexual minority respondents, these measures tended to focus on general use of emotion regulation strategies, rather than use of emotion regulation strategies in response to stigma-related stressors. More specific measures have generally not been developed and validated on samples of sexual minority women. Future research should develop and validate such measures. Furthermore, future efforts to replicate the findings of this analysis should make use of these validated, more specific measures.

This study is only a first step in a larger research agenda. As this research agenda is extended, future projects should attempt to address limitations of this current project. Firstly, as described above, though this model is based off of a thorough review of the extant literature, there exist several plausible alternative ways of constructing this model (e.g., with depression symptoms as a predictor of alcohol use), future research should test alternative configurations of this model. Secondly, though the evaluation of this model controlled for race/ethnicity and sexual orientation, it did not test how model fit and relationships compared across categories of race/ethnicity, sexual orientation, or gender identity. Future research should engage in multi-group analyses, comparing model fit across these axes of identity and their intersections. Since the hypotheses that suppression and social support would moderate the relationship between alcohol use and alcohol use symptoms were informed by research focused on Black and Latino samples (Zemore et al., 2016), it may be that these hypotheses are more likely to be supported among samples of Black and Latina sexual minority women relative to white sexual minority women. Since men engage in higher levels of alcohol use and expressive suppression relative to women, it may be that stigma would be more likely to predict alcohol use and expressive suppression for men relative to women (Keyes et al., 2008; Kring & Gordon, 1998). If model fit is poor for particular demographic groups, additional models should be created that better capture the mechanisms driving mental health disparities for these demographic groups.

Social support emerged as the only model construct that mediated the relationship between stigma-related stressors and depression. As described previously, social support is a construct that is poorly understood and seldom defined in the literature (Hogan, Linden, & Najarian, 2002). As Pacey (2016) has identified through qualitative interviews with gender and sexual minority individuals, sexual minority individuals hold a range of social support needs, including social acceptance, emotional support (which included support in coping with/protection from stigma-related stressors), and support with sexual minority identity development. Furthermore, Pacey (2016) found that respondents received different types of social support from different community members (e.g., receiving emotional support from both

heterosexual and sexual minority community members but primarily receiving sexual minority identity development support from sexual minority community members). Similarly, in a study of women accessing substance use treatment services, Tracy, Munson, Peterson, and Floersch (2010) found that the women in their sample reported experiencing emotional, tangible, and informational social support, and that each type of social support offered unique benefits and drawbacks for their efforts to maintain their sobriety. Taken together, these two studies suggest that social support is a multi-dimensional construct that may relate differently to distinct aspects of life experiences (e.g., coping with stigma-related stressors vs. maintaining sobriety). Thus, as we continue to explore the relationship between social support and depression symptoms and alcohol use symptoms for sexual minority women, it is essential that we pursue a more nuanced understanding of these dimensions of social support, how dimensions of social support are associated with distinct aspects of identity, stigma, and mental health outcomes and their intersections, and promising sources for each dimension of social support.

Similarly, suppression is a multi-dimensional construct (e.g., thought, emotion, expressive suppression) requiring more nuanced consideration. Only expressive suppression was captured in this analysis, neglecting these other dimensions of suppression (Gold, Feinstein, Skidmore, & Marx, 2011; Liverant, Kamholz, Sloan, & Brown, 2011). Given the findings that women may actually engage in lower levels of expressive suppression (Kring & Gordon, 1998) but higher levels of thought and emotion suppression (Hayes & Feldman, 2004; Wegner & Zanakos, 1994) than men, these other forms of suppression may be more relevant for sexual minority women and should be considered in future analyses.

At the core of this study is the goal of understanding and addressing co-occurring depression symptoms and alcohol use symptoms among sexual minority women. The model, as proposed and tested, more effectively identified mechanisms implicated in depression symptoms than in alcohol symptoms. Thus, it is critical to explore additional mechanisms that may be implicated in both depression symptoms and alcohol use symptoms, such as acceptance, avoidance, active problem solving, and cognitive reappraisal that are not included in this model but may have an important role to play in explaining these disparities (Aldao & Nolen-Hoeksema, 2010). Among general samples, greater levels of acceptance, active problem solving, and cognitive reappraisal have been associated with better mental health outcomes (Aldao et al., 2010; Gross & John, 2003). Considering such mechanisms may be valuable for explaining a larger portion of the variance in these mental health outcomes. The benefits of adding emotion regulation mechanisms to the model should be weighed against the drawbacks of reducing parsimony using established statistical procedures (Kelloway, 2015). Since these mechanisms are also amenable to existing evidence-based practices (Beck, 2011; Linehan, Bohus, & Lynch, 2007), explaining a greater portion of the variance allows for greater opportunity to intervene upon mental health symptoms. Lastly, the sample of respondents included in this study are drawn from the general population, not a clinical sample. Though this has the benefit of improving the generalizability of the findings from this study, there may be fundamental differences in how this model applies to a general sample relative to a sample with co-occurring depression symptoms and alcohol use symptoms. Thus, it is worth testing this model, as well as alternative models, on both general samples and samples affected with depression symptoms, alcohol use symptoms, or their co-occurrence.

Future Directions for Intervention

Overall, stigma-related stressors and the proposed emotion regulation mechanisms were more strongly associated with depression symptoms than with alcohol use symptoms. Thus, as described above, the model was re-run with only the depression symptoms outcome to determine how strongly depression symptoms are associated with the mechanisms in the proposed model. The results of the test of the post-hoc depression model provide empirical support for mechanisms that may be associated with depression symptoms among a sample of sexual minority women. Namely, higher levels of suppression, higher levels of alcohol use, and lower levels of social support were all found to be associated with a greater number of depression symptoms, with social support mediating the relationship between stigma and depression (i.e., greater number of stigma-related stressors being associated with lower levels of social support which was associated with a greater number of depression symptoms). Even though suppression and alcohol use did not mediate the relationship between stigma-related stressors and depression symptoms, higher levels of these constructs were still associated with a greater number of depression symptoms and thus may be worthy targets of intervention. Critically, each of these mechanisms can be intervened upon using evidence-based treatments to potentially reduce depression symptoms. The purpose of this section is not to fully establish an intervention that addresses the factors in the proposed model but rather to identify existing evidence-based practices that can potentially be applied to constructs in this model.

This discussion of evidence-based practices will be divided into two sections. The first will describe interventions and techniques intended to address the mechanisms of suppression and alcohol use and the second section will describe interventions and techniques intended to address the mechanism of social support. Social support is considered separately from suppression and alcohol use because although some of the interventions that are linked to reductions in suppression and alcohol use (dialectical-behavioral therapy and acceptance and commitment therapy) are associated with improved social support, the techniques and mechanisms through which social support improves are likely different from the techniques and mechanisms linked to improvement for suppression and alcohol use.

Addressing the mechanisms of suppression and alcohol use. As described above, suppression has been found to predict depression symptoms (Nolen-Hoeksema, 2000; Werner et al., 2011). Extant research has found mindfulness-based cognitive therapy, dialectical-behavioral therapy, and acceptance and commitment therapy to be promising interventions to address both suppression and depression symptoms. Mindfulness-based cognitive therapy has been found effective in reducing suppression (Kumar et al., 2008; Segal, Williams, & Teasdale 2002), and depression (Hofmann, Sawyer, Witt, & Oh, 2010; Kumar, Feldman, & Hayes, 2008; Vøllestad, Nielsen, & Nielsen, 2012) using techniques that include imagery, focused breathing, and acceptance (Teasdale et al., 2000). Though no known studies have specifically evaluated the effects of mindfulness-based cognitive therapy on alcohol use, a closely-related intervention, mindfulness-based relapse prevention, that also uses the techniques of imagery, focused breathing, and acceptance with some additional skills training oriented toward helping clients identify and respond to triggers of substance use, has been shown effective in reducing alcohol use (Bowen et al., 2009). Dialectical-behavioral therapy has been found effective in reducing suppression (Feldman et al., 2009; Lynch, Morse, Mendelson, & Robins, 2003), alcohol use (Linehan, 1993), and depression symptoms (Feldman et al., 2009; Lynch, Morse, Mendelson, &

Robins, 2003) through the use of techniques that include imagery, focused breathing, and acceptance (Linehan, 1993). Acceptance and commitment therapy has been found effective in reducing suppression (Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Luoma, Kohlenberg, Hayes, Bunting, & Rye, 2008), alcohol use (Thekiso et al., 2015), and depression (Forman et al., 2007) using techniques of imagery and acceptance (Hayes, Strosahl, & Wilson, 2011).

Though each of these interventions utilize many techniques, they generally share the common techniques of imagery, focused breathing, and acceptance. These techniques have, themselves, been linked to reductions in some of these mechanisms and symptoms. Though no known research specifically examines the relationship between focused breathing and emotion regulation mechanisms (i.e., suppression and alcohol use), focused breathing (e.g., focusing on the sensation of breathing or pacing breathing to a particular count; Linehan, 1993) has been found to reduce symptoms of depression (Brown & Gerbarg, 2005). Though no known studies have specifically evaluated the effect of imagery exercises on suppression or alcohol use, imagery interventions (e.g., visualizing thoughts or feelings floating away on a leaf; Hayes, Strosahl, & Wilson, 2011) have been associated with reductions in depression (Blackwell et al., 2015; Brewin et al., 2009). The author was unable to identify any studies that specifically evaluate the effects of acceptance interventions (i.e., encouraging clients to accept difficult situations rather than avoid or attempt to change them; Chambers, Gullone, & Allen, 2009); rather most acceptance interventions occurred in the context of composite interventions with many components (e.g., acceptance and commitment therapy or dialectical-behavioral therapy; Hayes et al., 2011; Linehan, 1993).

Addressing the mechanism of social support. To improve social support, dialectical-behavior therapy utilizes the techniques of interpersonal effectiveness skills training and emotion-regulation skills training with the intention of reducing interpersonal conflict; though no known studies of dialectical-behavioral therapy directly measure social support as a treatment outcome, dialectical-behavioral therapy has been linked to reductions in clients' scores on an assessment measuring negative relationships (Stepp, Epler, Jahng, & Trull, 2008). In a study of women with borderline personality disorder engaging in dialectical behavioral therapy that found mindfulness skills and social support to be highly correlated, O'Toole, Diddy, and Kent, (2012) argue that the proficiency in mindfulness skill may help individuals to maintain control of their emotions which may, in turn, facilitate their ability to develop social support networks. Though acceptance and commitment therapy does not directly target social support, one study of outcomes of acceptance and commitment therapy found a significant change on the subscale measuring social support from friends (but not on subscales measuring social support from family or significant others; Luoma et al., 2008). Furthermore, and of particular relevance to this study, in an intervention study of an application of Acceptance and Commitment Therapy to internalized homophobia among a sample of sexual minority participants, Yadavaia and Hayes (2012) found participants who received Acceptance and Commitment Therapy to show significant improvements in social support.

Similarities across cognitive-behavioral interventions. It is important to note that all three of the interventions described (mindfulness-based cognitive-therapy, dialectical-behavioral therapy, and acceptance and commitment therapy) stem from cognitive-behavioral therapy. Though social support does not appear to be a primary focus of these interventions, standard cognitive-behavioral therapy contains components focused on increasing social support. In a general sample of individuals living with depression, social skills training was found effective

for improving social support and reducing depression symptoms (Herbert et al., 2005). Thus, since social support was associated with depression symptoms among sexual minority women, social skills training may be a particularly important component of an intervention oriented toward reducing depression symptoms for sexual minority women with depression symptoms.

Conclusions about the interventions. A primary strength of the proposed application of evidence-based techniques to sexual minority women with depression symptoms is that each intervention is an evidence-based practice that maps on to at least two of the emotion regulation mechanisms (suppression, social support, or alcohol use) and has been empirically demonstrated to reduce symptoms depression. The justifications for applying techniques (imagery, focused breathing, acceptance) from mindfulness-based cognitive therapy, dialectical-behavioral therapy, and acceptance and commitment therapy to address emotion regulation mechanisms and mental health outcomes are not without their limitations. For instance, each of the interventions have many components, making it difficult to determine which components are most critical for the observed changes in mechanisms and symptoms (Hayes et al., 2011; Linehan, 1993; Teasdale et al., 2000; Watkins et al., 2011). Similarly, though these interventions share techniques (focused breathing, imagery, acceptance), there may be subtle differences in the content of these techniques that affect the integration of these interventions and clinical outcomes. This threat is particularly significant given that few of the techniques have been tested individually to determine their effects on emotion regulation mechanisms and mental health symptoms. Components of this intervention could potentially be contradictory or contraindicated (e.g., seeking social support may be a distraction that could promote suppression, similar to how safety behaviors may minimize the effectiveness of exposure therapy; Powers, Smits, & Telch, 2004). As an intervention is formulated from the suggested techniques, attention will need to be paid to determining when each intervention component should be applied. Another important consideration is that although the interventions described have empirical support, they have not generally been validated for sexual minority women living depression symptoms. Most of the efficacy trials have utilized general samples undifferentiated by sexual orientation (Forman et al., 2007; Bowen et al., 2009) or samples of individuals living with other disorders (e.g., borderline personality disorder; O'Toole, Diddy, & Kent, 2012). Furthermore, many of these interventions were tested on individuals who had been classified as treatment resistant to traditional interventions (Teasdale et al., 2000; Watkins et al., 2011). Thus, utilizing more traditional cognitive-behavioral interventions for depression may be sufficient for many sexual minority female clients living with depression (Beck, 1979; Beck, 2011).

An intervention developed from these recommended techniques would need to be empirically tested. After the precise mindfulness and other components are selected, the intervention would optimally be tested by utilizing randomized controlled-trials to determine if the intervention reduces depression symptoms and alcohol use symptoms for sexual minority women. Such an evaluation should also determine treatment effects by race/ethnicity and other demographic variables. If some demographic groups show weaker treatment outcomes, additional interventions should be created that better address the needs of members of these groups. Such a study should test multiple mindfulness and other intervention components against each other and suitable control conditions.

Even this intensive evaluation strategy has flaws. Firstly, this proposal is likely prohibitive in terms of required resources and sample sizes necessary to achieve statistical power. Secondly, there are many common elements and principles contained in each intervention

and technique, which may obscure which elements of the interventions are most effective in influencing emotion regulation mechanisms and symptoms. Even after developing an intervention that targets appropriate mechanisms for sexual minority women living with depression, additional barriers may exist to sexual minority women with depression accessing effective care. For instance, therapists may hold negative attitudes and or lack necessary cultural competence for working with sexual minority clients (Eubanks-Carter et al., 2005; Mundon et al., 2015; Shelton & Delgado-Romero, 2011). Though a new intervention may play a critical role in addressing therapist competence in supporting these clients, training in utilizing such an intervention will likely need to be paired with cultural competence/humility trainings that facilitate changes in therapist attitudes about working with sexual minority clients and clients with substance use challenges.

Similarly, to how developing an intervention is only one piece of addressing this disparity, it is essential that we consider more preventative and structural environmental interventions, such as promoting legal and cultural shifts, in conjunction with improved clinical approaches. In addition to potentially preventing stressors that are risk factors for depression and thus possibly preventing depression itself, environmental interventions communicate the message that sexual minorities are not the only ones responsible for their mental health. This message may reduce self-blame and internalized stigma, which are, themselves, also risk factors for depression (Hatzenbuehler, 2009; LaSala, 2006). Furthermore, social support is a core aspect of the proposed intervention, and thus the creation of communities where sexual minorities can fully engage, free of stigma, is an essential aspect of promoting social support for this vulnerable population. As environmental interventions are envisioned and enacted, evaluation studies should be conducted to determine the effects of these interventions on sexual minorities' mental health.

There remains considerable work to be done in terms of developing a model that explains an adequate portion of the variance in depression among sexual minority women and developing an intervention that targets the relevant mechanisms. However, this dissertation takes important first steps toward understanding and addressing the mental health needs of sexual minority women living with depression symptoms, a population that has been severely under-researched and likely underserved.

Conclusion

This dissertation has proposed and tested a model of co-occurring depression symptoms and alcohol use symptoms among sexual minority women whereby emotion regulation mechanisms (suppression, alcohol use, and social support) were proposed to explain the relationship between stigma-related stressors and depression symptoms and alcohol use symptoms. In this dissertation, a greater number of stigma-related stressors was hypothesized to be associated with higher levels of suppression, higher levels of alcohol use, and lower levels of social support, which were hypothesized to be associated with a greater number of depression symptoms. Higher levels of alcohol use were hypothesized to be associated with a greater number of alcohol use symptoms; higher levels of suppression were hypothesized to weaken this relationship, whereas higher levels of social support were hypothesized to strengthen this relationship.

We found that social support mediates the relationship between stigma-related stressors and depression symptoms in the proposed direction. Though they do not mediate the relationship between stigma-related stressors and depression, higher levels of alcohol use and suppression were also found to be associated with greater levels of depression. Our findings did not support any mediation of the relationship between stigma-related stressors and alcohol use symptoms, nor moderation of the relationship between alcohol use and alcohol use symptoms. Our findings suggest that suppression, alcohol use, and social support may all be worthwhile targets of intervention for depression for sexual minority women. This dissertation identifies potential intervention strategies that may be useful in targeting these mechanisms. Future research should examine a broader range of potential emotion regulation strategies that may drive co-occurring depression symptoms and alcohol use symptoms among sexual minority women and develop and evaluate interventions that target these mechanisms. These are all critical steps in ensuring that clinicians can meet the needs of this vulnerable population.

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Appendix A: Model Constructs and Measures

Table 16. Definitions of model constructs

Model	Construct	Definition
Minority Stress Model (Meyer, 2013)	General stressors	“Events and conditions (e.g., losing a job, death of an intimate) that cause change and that require that the individual adapt to the new situation or life circumstance” (p. 2)
	Minority stress processes (distal)	“Objective stressors in that they do not depend on an individual’s perceptions or appraisals—although certainly their report depends on perception and attribution” (p. 5)
	Prejudice events	Real and observable phenomena that are experienced as stressful, such as discrimination and violence (p. 9-10)
	Minority stress processes (proximal)	“Subjective appraisal as a manifestation of distal, objective environmental conditions” (p.5)
	Expectations of rejection	Anticipation and expectation of “negative regard from members of the dominant culture” (p. 11)
	Concealment	Hiding identity for fear of harm (p.5)
	Internalized homophobia	“Direction of negative social attitudes toward the self, leading to a devaluation of the self and resultant internal conflicts and poor self-regard” (p. 14)
	Characteristics of minority identity	No definition provided
	Prominence	Salience “of minority identity in the person’s sense of self” (p. 7)
	Valence	Level of self-acceptance and internalized homophobia (p. 8)
	Integration	Integration of the minority identity with the person’s other identities (p. 8)
	Minority Coping	A group-level resource, related to the group’s ability to mount self-enhancing structures to counteract stigma (p. 7)
	Social Support	No definition provided
	Hatzenbuehler and colleagues (2009)	Stigma-related stressors
Rumination		“Inhibiting emotionally expressive behaviors” (p. 2)
Suppression		“Tendency to passively and repetitively focus on one’s symptoms of distress and the circumstances surrounding these symptoms” (p. 2)
Social support		No definition provided
Psychological Mediation Framework (Hatzenbuehler, 2009)	Distal stigma-related stressors	“Prejudice-inspired events, including violence/victimization and discrimination” (p. 6)
	Coping/emotion regulation	“Conscious and nonconscious strategies we use to increase, maintain, or decrease one or more components of an emotional response” (p. 10)
	Rumination	“Maladaptive emotion regulation strategy in which an individual passively and repetitively focuses on his/her symptoms of distress and the circumstances surrounding these symptoms” (p. 11)
	Coping motives	“Strategic use of alcohol to escape, avoid, or otherwise regulate negative emotions” (p. 16)

	Social/interpersonal processes	No definition provided
	Social isolation	No definition provided
	Social norms	“Influence of the environment on an individual’s level of alcohol consumption” (p. 16)
	Cognitive processes	“Thought processes (both the content of thoughts as well as the process of thinking) that exacerbate, maintain, or prolong symptoms of depression and anxiety” (p. 14)
	Hopelessness	“The belief that negative events will occur (or, conversely, that desired events will not occur) and that there is nothing the individual can do to change the situation” (p. 14)
	Negative self-schemas	“Negative views of the self” (p. 15)
	Alcohol expectancies	“Expectations of positive and negative reinforcement from drinking alcohol such as increased sociability and decreased tension” (p. 17).
Lehavot & Simoni (2011)	Gender expression	“Qualities that are culturally assigned to social categories such as masculine or feminine” (p. 4)
	Appearance	No definition provided
	Gender roles	No definition provided
	LGB victimization	“Harassment and rejection, workplace and school discrimination, other discrimination, and prejudice events” (p. 9)
	Concealment	“Degree of disclosure of sexual orientation” (p. 7)
	Internalized homophobia	“Internalization of socially sanctioned homophobia” (p. 3)
	Psychosocial resources	No definition provided
	Spirituality	“Intrapersonal coping (i.e., the sense of meaning, purpose, and morality that individuals espouse regarding their lives)” (p. 4)
	Social support	“An interpersonal phenomenon (i.e., reaching out to others)” (p. 4)

Table 17. Measures and items

Model Construct	Measure	Item	Response Options
Depression Symptoms	Patient Health Questionnaire (PHQ)	Over the last 2 weeks, how often have you been bothered by the following problem: Little interest or pleasure in doing things?	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
		Over the last 2 weeks, how often have you been bothered by the following problem: Feeling down, depressed, or hopeless?	
		Over the last 2 weeks, how often have you been bothered by the following problem: Trouble falling or staying asleep?	
		Over the last 2 weeks, how often have you been bothered by the following problem: Feeling tired or having little energy?	

		Over the last 2 weeks, how often have you been bothered by the following problem: Poor appetite or overeating?	
		Over the last 2 weeks, how often have you been bothered by the following problem: Feeling bad about yourself - or that you are a failure or have let yourself or your family down?	
		Over the last 2 weeks, how often have you been bothered by the following problem: Trouble concentrating on things, such as reading the newspaper or watching television?	
		Over the last 2 weeks, how often have you been bothered by the following problem: Moving or speaking so slowly that other people could have noticed - or being so fidgety or restless that you have been moving around a lot more than usual?	
		Over the last 2 weeks, how often have you been bothered by the following problem: Thoughts that you would be better off dead or of hurting yourself in some way?	
Alcohol Use Symptoms	AUDIT: Dependence Subscale	How often during the last year have you found that you were not able to stop drinking once you had started?	Never (0) Less than monthly (1) Monthly (2) Weekly (3) Daily or almost daily (4)
		How often during the last year have you failed to do what was normally expected from you because of drinking?	
		How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	
	AUDIT: Consequences Subscale	How often during the last year have you had a feeling of guilt or remorse after drinking?	
		How often during the last year have you been unable to remember what happened the night before because you had been drinking?	
		Have you or someone else been injured as a result of your drinking?	No (0) Yes, but not in the last year (2)
		Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?	Yes, during the last year (4)

EMOTION REGULATION STRATEGIES MEDIATING VARIABLES			
Suppression	Emotion Regulation Questionnaire (ERQ): Cognitive Reappraisal	When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.	Strongly disagree (1) (2) (3) Neutral (4) (5) (6) Strongly agree (7)
		I control my emotions by changing the way I think about the situation I'm in.	
		When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.	
		When I want to feel less negative emotion, I change the way I'm thinking about the situation.	
		When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.	
	Emotion Regulation Questionnaire (ERQ): Expressive Suppression	I control my emotions by not expressing them.	
		I keep my emotions to myself.	
		When I am feeling positive emotions, I am careful not to express them.	
		When I am feeling negative emotions, I make sure not to express them.	
Social Support	PROMIS: Emotional Support Subscale	I have someone who will listen to me when I need to talk.	Never (0) Rarely (1) Sometimes (2) Usually (3) Always (4)
		I have someone to confide in or talk to about myself or my problems.	
		I have someone who makes me feel appreciated.	
		I have someone to talk with when I have a bad day.	
Alcohol Use	AUDIT: Quantity-Frequency Subscale	How often did you have a drink containing alcohol in the past year?	Never (0) Monthly or less (1) 2-4 times per month (2) 2-3 times a week (3) 4 or more times a week (4)
		How many drinks did you have on a typical day when you were drinking in the past year?	
		How often do you have six or more drinks on one occasion in the past year?	

Stigma-Related Stressors Predictor Variable			
Stigma-Related Stressors	Experiences in Society	Have you EVER experienced harassment or name calling from strangers in public?	No (0) Yes (1)
		Have you EVER been physically attacked or deliberately injured?	
		Have you EVER experienced physical violence from a romantic partner?	
		Have you EVER experienced unwanted sexual contact?	
		Have you EVER been treated unfairly at work or when applying/interviewing for a job?	
		Have you EVER been treated unfairly while trying to rent an apartment or buy a home, or been unfairly evicted from your residence?	
		Have you EVER received poorer service than other people in restaurants, stores, other businesses or agencies?	
		Have you EVER been treated unfairly while you were a student at school or in another educational setting?	
		Have you EVER been denied or given lower quality medical care?	
		Have you EVER been denied or given lower quality mental health care?	
		Have you EVER experienced unfair treatment or harassment from the police or another law enforcement officer?	

Control Variables			
Internalized Homophobia	Internalized Homophobia Scale (IHP-R)	I wish I weren't gay/lesbian/bisexual/sexual minority.	Disagree strongly (1) Disagree somewhat (2) Neither agree nor disagree (3) Agree somewhat (4) Agree strongly (5)
		I have tried to stop being attracted to people of the same gender in general.	
		If someone offered me the chance to be completely heterosexual, I would accept the chance.	
		I feel that being gay/lesbian/bisexual/sexual minority is a personal shortcoming for me.	
		I would like to get professional help in order to change my sexual orientation from gay/lesbian/bisexual/sexual minority to heterosexual.	

Concealment	Nebraska Outness Scale (NOS): Disclosure	What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? Members of your immediate family (for example, parents and siblings) [Reverse coded]	0% (0) 10% (1) 20% (2) 30% (3) 40% (4) 50% (5)
		What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? Members of your extended family (for example, aunts, uncles, grandparents, cousins) [Reverse coded]	60% (6) 70% (7) 80% (8) 90% (9) 100% (10)
		What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? People you socialize with (for example, friends and acquaintances) [Reverse coded]	
		What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? People at your work/school (for example, coworkers, supervisors, instructors, students) [Reverse coded]	
		What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? Strangers (for example, someone you have a casual conversation with in line at the store) [Reverse coded]	
		What percent of the people in this group do you think are aware of your sexual orientation (meaning they are aware of whether you consider yourself straight, gay, etc.)? Health care providers [Reverse coded]	
		Nebraska Outness Scale (NOS): Concealment	How often do you avoid talking about topics related to or otherwise indicating your sexual orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? Members of your immediate family (for example, parents and siblings)
How often do you avoid talking about topics related to or otherwise indicating your sexual orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? Members of your extended family (for example, aunts, uncles, grandparents, cousins)	(7) (8) (9) Always (10)		
How often do you avoid talking about topics related to or otherwise indicating your sexual			

	orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? People you socialize with (for example, friends and acquaintances)
	How often do you avoid talking about topics related to or otherwise indicating your sexual orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? People at
	How often do you avoid talking about topics related to or otherwise indicating your sexual orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? Strangers (for example, someone you have a casual conversation with in line at the store)
	How often do you avoid talking about topics related to or otherwise indicating your sexual orientation (e.g., not talking about your significant other, changing your mannerisms) when interacting with members of this group? Health care providers

DEMOGRAPHICS

Psychosis		Has a mental health professional or physician EVER told you that you have Schizophrenia or a psychotic disorder?	Yes (1) No (0) Don't know (88)
Gender		Current gender identity (check all that apply)	Genderqueer Man Transgender man (female-to-male) Transgender woman (male-to-female) Woman Another gender identity [free text]
Sex assigned at birth		Sex assigned at birth on your original birth certificate	Male Female

Current sexual orientation		Current sexual orientation (check all that apply)	Asexual Bisexual Gay Lesbian Pansexual Queer Questioning Same-gender loving Straight/heterosexual Another sexual orientation [free text]
Race		Race (check all that apply)	American Indian or Alaska Native Asian Black or African American Native Hawaiian or other Pacific Islander White Another race [free text]
Ethnicity		Are you Hispanic, Latino, or of Spanish origin?	Yes No

Table 18. Measure reliability, validity, and scoring

Measure Name	Reliability/Validity Information	Scoring Information
Patient Health Questionnaire	<p>Reliability: Cronbach's $\alpha = 0.89$</p> <p>Criterion validity: Sensitivity = 95% Specificity = 84%</p> <p>Construct validity: Significant associations with SF-20 Health-related Quality of Life Scales ($p < .05$)</p> <p>(Kroenke, Spitzer, & Williams, 2001)</p> <p>Previously used with sexual minority women (Grant et al., 2014)</p>	<p>Scale 0-27</p> <p>Sum of responses</p> <p>0-4 None 5-9 Mild 10-14 Moderate 15-19 Moderately Severe 20-27 Severe</p> <p>(Maurer, 2012)</p>
Alcohol Use Disorders Identification Test (Full)	<p>Reliability: Cronbach's $\alpha = 0.83$</p> <p>Concurrent validity: Pearson's $R = .88$ ($p < .001$)</p>	<p><i>Total scale</i></p> <p>Scale 0-40</p> <p>Sum of responses</p> <p>0-7 No alcohol problems 8-15 Medium level alcohol problems</p>

	<p>Construct validity: significant associations with 11 out of 12 validation measures ($p < .01$)</p> <p>Discriminant validity: All three subscales distinguished individuals classified as harmful drinkers from individuals not classified as harmful drinkers ($p < .001$)</p> <p>(Bohn, Babor, & Kranzler, 1995)</p> <p>Previously used with sexual minority women (Bekele et al., 2013)</p>	<p>16-40 High level alcohol problems</p> <p><i>Quantity-Frequency Scale</i> Scale 0-12 Sum of responses</p> <p>1+ on items 2 or 3 indicates consumption at hazardous levels</p> <p><i>Dependence Scale</i> Scale 0-12 Sum of responses</p> <p>1+ on items 4-6 indicates presence or incipience of alcohol dependence</p> <p><i>Consequences Scale</i> Scale 0-16 Sum of responses</p> <p>1+ on items 7-10 indicates that alcohol-related harm is already being experienced</p> <p>(Babor et al., 2001)</p>
Alcohol Use Disorders Identification Test (Quantity-Frequency Subscale)	<p>Reliability: Cronbach's $\alpha = 0.94$</p> <p>Concurrent validity = .97</p> <p>(Meneses-Gaya et al., 2010)</p> <p>Previously used with sexual minority women (Bekele et al., 2013)</p>	<p><i>Quantity-Frequency Scale</i> Scale 0-12 Sum of responses</p> <p>1+ on items 2 or 3 indicates consumption at hazardous levels</p> <p>(Babor et al., 2001)</p>
Emotion-Regulation Questionnaire	<p>Construct validity: Significant associations with all 10 validation measures ($p < .05$)</p> <p>Discriminant validity: significant associations (beta between $-.14$ and $-.41$; $p < .05$) for 4 out of 5 Big Five personality factors.</p> <p>(Gross & John, 2003)</p> <p>Previously used with sexual minority women (Hatzenbuehler et al., 2009)</p>	<p>Scale 10-70</p> <p>Sum of responses</p> <p>No known cut-off points</p>
PROMIS: Emotional Support Subscale	<p>No known validation studies; no known research with sexual minority women.</p>	<p>Scale 4-16</p> <p>Sum of responses</p> <p>No known cut-off points</p>
Nebraska Outness Scale	<p>Convergent validity = .84 ($p < .01$)</p>	<p>Scale 0-120</p>

	<p>Discriminant validity = $-.45$ ($p < .01$)</p> <p>Predictive validity = $-.43$ ($p < .01$)</p> <p>(Meidlinger & Hope, 2014)</p> <p>Previously used with sexual minority women (Meidlinger & Hope, 2014)</p>	<p>Sum of responses</p> <p>No known cut-off points</p> <p>(Meidlinger & Hope, 2014)</p>
Experiences in Society	<p>Created for The PRIDE Study; no known validation studies or research with sexual minority women.</p>	<p>Scale 0-11 for total experiences</p> <p>Sum of responses</p> <p>No known cut-off points</p>
Internalized Homophobia Scale- Revised	<p>Full “IHP scale has acceptable internal consistency and correlated as expected with relevant measures” (p. 2). Original source could not be accessed.</p> <p>(Herek et al., 1997)</p> <p>Reliability: Cronbach's $\alpha = 0.85$ (mentioned in Herek, Gillis & Cogan, 2015)</p> <p>Previously used with sexual minority women (Herek et al., 1997)</p> <p>Shortened version has not been subject to full validation study. However, some information is known:</p> <p>Reliability: Cronbach's $\alpha = 0.82$ Convergent validity (with full scale) = $.90$</p> <p>(Herek, Gillis & Cogan, 2015).</p> <p>Previously used with sexual minority women (Herek, Gillis & Cogan, 2015).</p>	<p>Full scale includes 9 items and was originally developed for gay men; shortened version consists of 5 items; items have been modified from full scale to be more inclusive of lesbian and bisexual women (e.g., including “lesbian/bisexual” rather than just “gay” in the question stem).</p> <p>Full Scale 9-45 Shortened Scale 5-25</p> <p>Sum of responses</p> <p><u>Full Scale</u> 10.22 mean score for sexual minority women scoring in bottom half of responses 17.00 mean score for sexual minority women scoring in top half of responses</p> <p>(Herek et al., 1997)</p> <p><u>Shortened Scale</u> 89% of lesbian women and 78% of bisexual women scored at or below a 15 (Herek, Gillis & Cogan, 2015).</p>

Appendix B: Descriptive Statistics

Table 19. Descriptive statistics- Sexual orientation*

Sexual Orientation	Frequency	Percent (%)
Lesbian	911	51.4
Gay	178	10.0
Bisexual	727	41.0
Pansexual	218	12.3
Queer	689	38.9
Same-Gender Loving	89	5.0
Total	2,812	

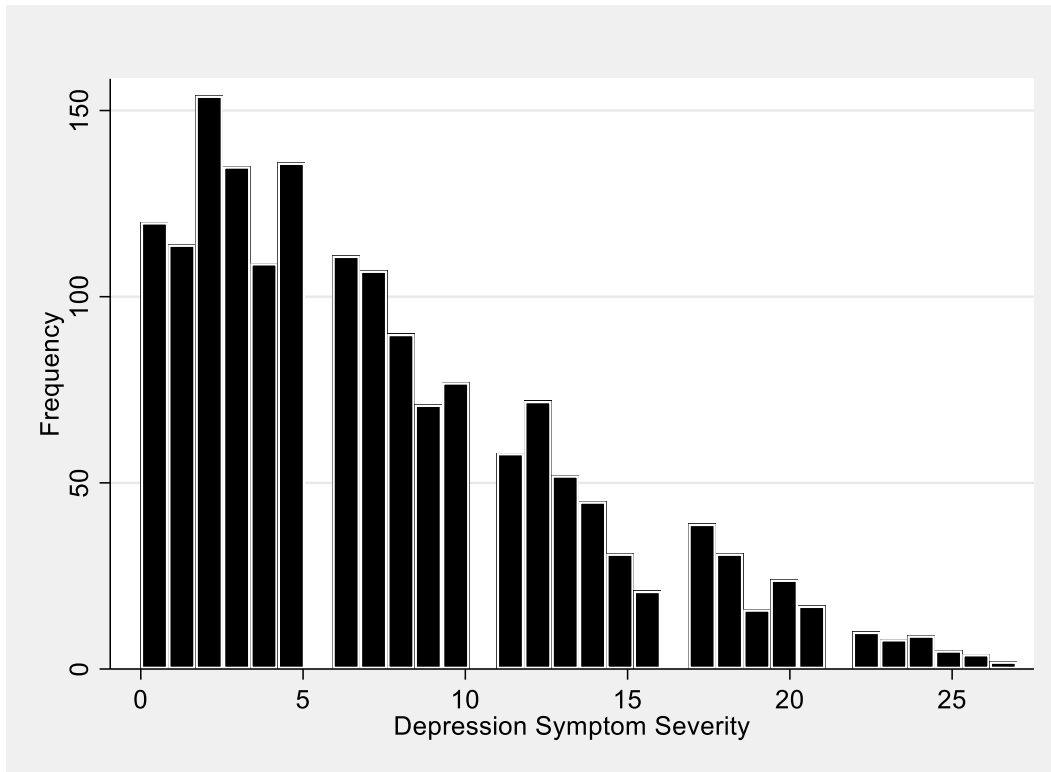
Note: *Respondents were allowed to provide multiple answers, so total exceeds the N of the study

Table 20. Descriptive statistics- Race/ethnicity*

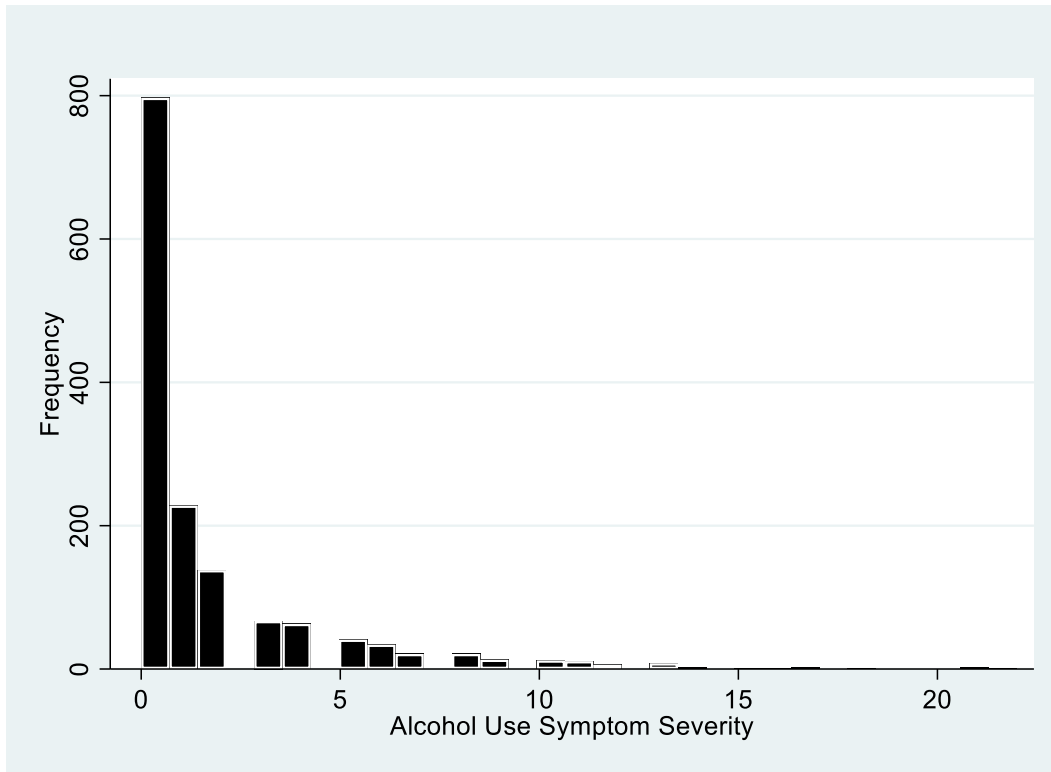
Race/Ethnicity	Frequency	Percent (%)
Asian	53	3.0
Black	59	3.3
Hawaiian	5	0.28
White	1,667	94.5
Latino	125	7.1
Other	45	2.6
Total	1,954	

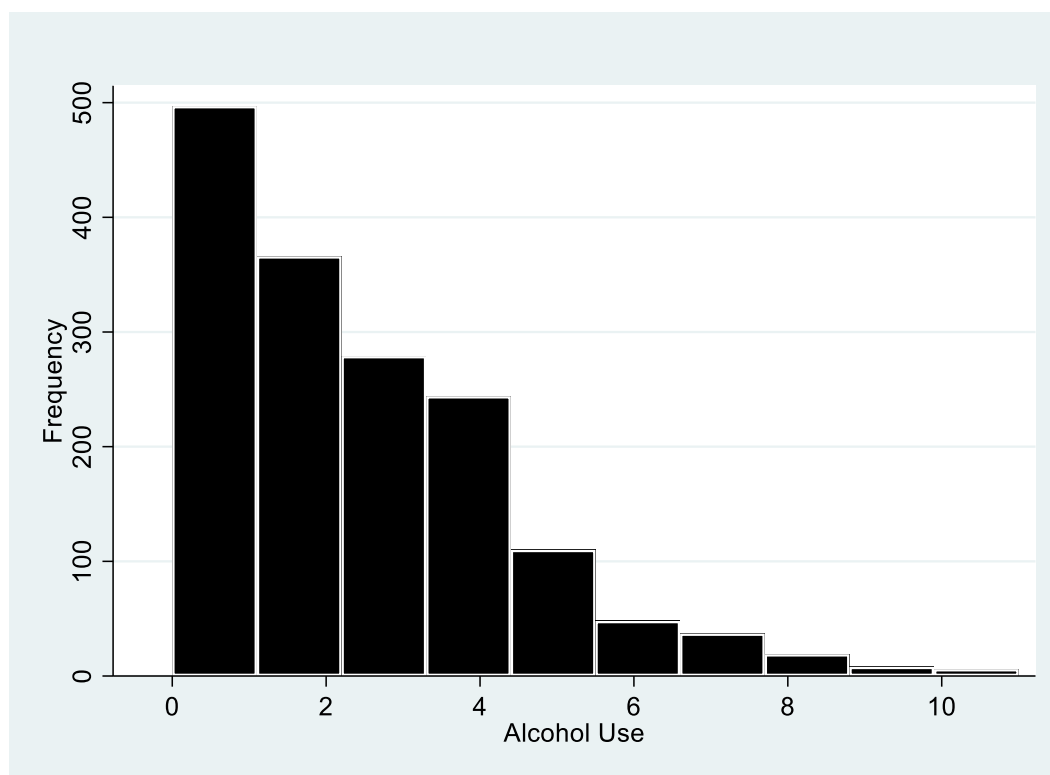
Note: *Respondents were allowed to provide multiple answers, so total exceeds the N of the study

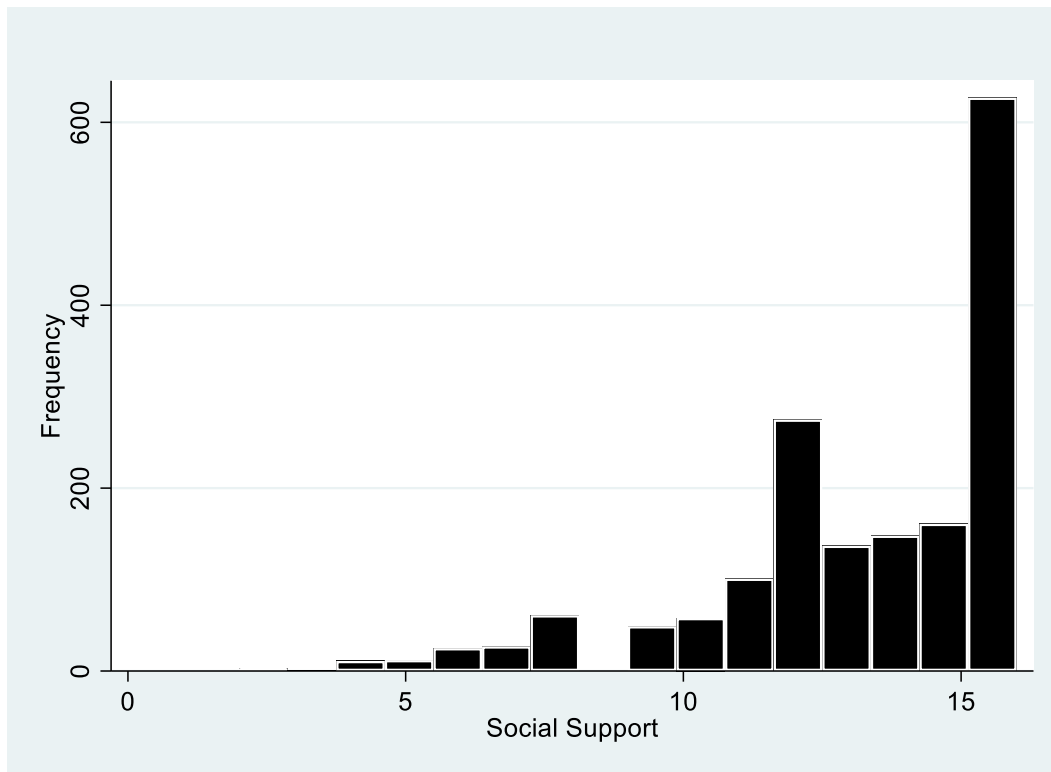
Graph 1. Mental health outcomes- Depression symptoms

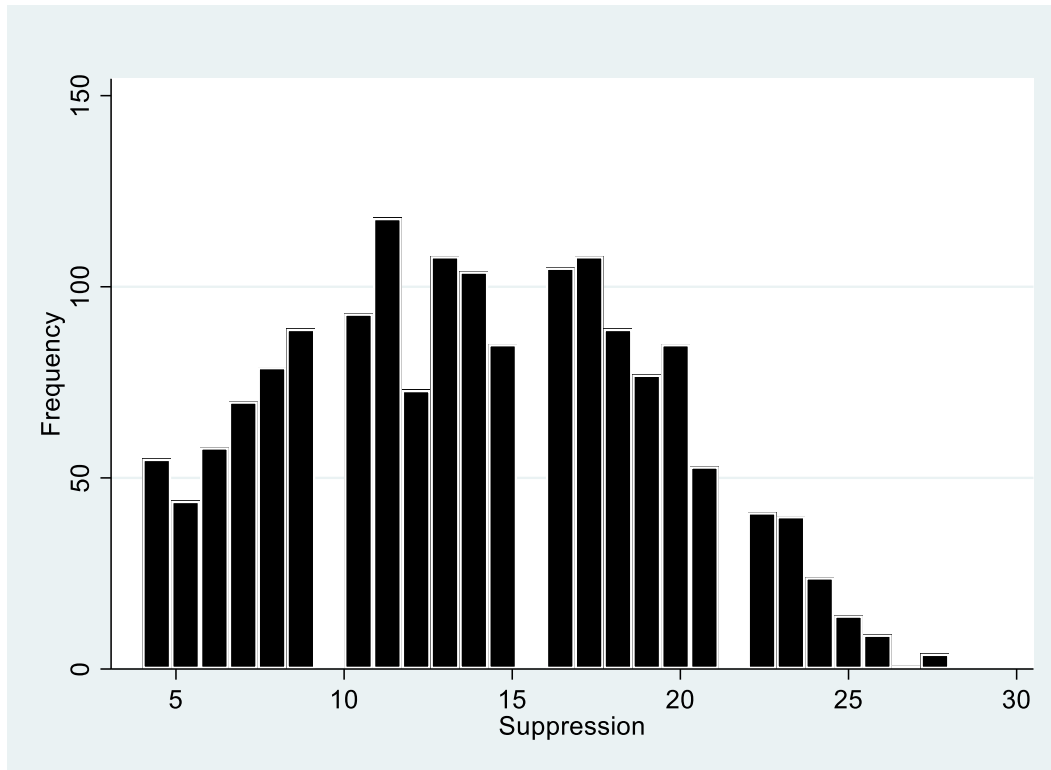


Graph 2. Mental health outcomes- Alcohol use symptoms



Graph 3. Emotion regulation mechanisms- Alcohol use

Graph 4. Emotion regulation mechanisms- Social support

Graph 5. Emotion regulation mechanisms- Suppression

Graph 6. Stigma-related stressors

