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A Mediated Model of Minority Stress and Binge Eating in Sexual Minority Women

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A MEDIATED MODEL OF MINORITY STRESS AND BINGE EATING IN SEXUAL MINORITY WOMEN

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ABSTRACT

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Previous studies have shown that sexual minority women (SMW) report more binge-eating behaviors than heterosexual women. Explanations for this differentiation have not been researched adequately. SMW also experience unique stressors related to minority sexual orientation. These minority stressors include both distal stressors (e.g. discrimination) and proximal stressors (e.g. expectations of rejection). Both types of stressors have been found to be integral in the development of negative mental and physical health outcomes in SMW. The importance of mediators and moderators in the minority stress and negative outcomes association has been demonstrated in previous literature. The purpose of the present study was to investigate the role of minority stressors in explaining binge-eating behaviors in SMW. A model was developed connecting minority stress to binge-eating through a network of mediated variables including barriers, mental health, and body shame. It was hypothesized that SMW would engage in binge-eating behaviors as predicted by the affect regulation model and psychological mediation framework. A sample of 164 SMW was recruited through a variety of online avenues. The model supported both the psychological mediation framework and the affect regulation model. The principal finding was that among SMW

proximal stressors activate barriers which in turn activate negative mental health and ultimately binge-eating. Implications of the study regarding interventions are discussed. Limitations of this research include its cross section design convenience sample. Future studies should use more sophisticated methodology including novel measurements of binge-eating behaviors. Overall, the study provides evidence that minority stress explains some of the disparities in binge-eating between sexual minority and heterosexual women.

This thesis is dedicated to my mom and sister for always being supportive of my endeavors.

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CHAPTER 1

INTRODUCTION

Sexual minority women (SMW) are at risk for a variety of mental health problems, most notably depression and anxiety (Coker, Austin, Schuster, 2010; Hughes, McCabe, Wilsnack, West, Boyd, 2010; Lehavot & Simoni, 2011; Mercer et al.; 2007; Meyer, 1995). The degree to which sexual minority women are at increased risk for eating disorders as well, particularly binge eating disorder, has not been examined extensively. However, some research has indicated that lesbians are more likely to report binge eating compared to heterosexual women (Austin et al., 2009; Bradford & Ryan, 1994; Heffernan, 1996; Striegel-Moore; 1990). In fact, according to the Lesbian Healthcare Survey, 68% of lesbians reported overeating sometimes or often (Bradford, Ryan, & Rothblum, 1994). Adolescent lesbians also reported more binge eating in comparison to heterosexuals in a sample of 13,785 young men and women (Austin et al., 2009). The purpose of the current study was to develop and test a preliminary model of binge eating behaviors in SMW connecting the unique experiences of SMW and the characteristic pathways to binge eating.

Eating Disorders: Anorexia Nervosa and Bulimia Nervosa

Eating disorders generally involve maladaptive eating patterns and/or disturbances in eating. The two most common and widely researched eating disorders are Anorexia Nervosa (AN) and Bulimia Nervosa (BN). AN symptoms include being severely underweight, an intense drive for thinness, disordered eating, and a greatly distorted body image (National Association of Anorexia Nervosa and Associated Disorders (ANAD), 2011). Symptoms of BN include periods of binge-eating associated

with a loss of control over eating followed by some sort of compensatory behavior (e.g., purging, excessive exercise, and/or use of laxatives). Additionally, a third category was added to the *DSM-IV-TR* (American Psychiatric Association [APA], 2000) labeled "Eating Disorders Not Otherwise Specified" (EDNOS) that includes individuals who do not meet the criteria for AN or BN but have significant disordered eating and/or body image disturbances (ANAD, 2011). Binge Eating Disorder (BED), which was once classified as EDNOS, is now considered as a separate eating disorder, and is under consideration for inclusion in the DSM-5, pending further consideration (Massey, 2011).

Risk factors. A number of risk factors have been associated with disturbed eating behaviors. Most of this research has been done with presumably heterosexual samples and identifies four general types of risk factors: (1) Gender; (2) Body shape and weight-related individual factors; (3) societal messages and teasing; and (4) individual personality and demographic characteristics. Unless otherwise specified, all studies reviewed in this section did not specify or assess the sexual orientation of the participants. Women are more likely to suffer from both AN and BN compared to men (ANAD, 2011). With regard to body shape and weight-related factors, preoccupation with body shape was the greatest predictor of general eating disorder symptomatology compared to concern for physical appearance, personal evaluation of physical appearance, perceived sociocultural pressure for thinness, and media influences promoting thinness in a sample of 412 young heterosexual and homosexual men and women (Strong, Williamson, Netemeyer, & Geer, 2000). Therefore, it is not surprising that Body Mass Index (BMI) was also associated with bulimic behavior in a sample of men and women fitness center attendees (McCabe, Ricciardelli, & James, 2007). Body

shame also significantly predicted disordered eating in a sample of 40 lesbian women (Lyders, 1999). In addition, body dissatisfaction, negative affect, and dieting were directly and positively related to bulimic behaviors in adolescent women (Hutchinson, Rapee, & Taylor, 2010). Jackson and Chen (2011) reported that appearance pressure, body dissatisfaction, and negative affect were the most salient factors predicting general disordered eating in a longitudinal study of Chinese adolescents.

In addition to shape and weight-related factors, media exposure also predicted eating disordered symptomatology indicative of AN and BN in women (Stice, Schupak-Neuberg, Shaw, & Stein, 1994). Similarly, in addition to BMI and menopausal status, Slevec and Tiggemann (2011) highlighted other risk factors for disordered eating behaviors among middle-aged women in a review of the literature including: internalization of society's idea of thinness, a history of being teased about weight, and anxiety.

With regard to personality and demographic characteristics, the trait of perfectionism was positively associated with disordered eating measured by the Eating Attitudes Test (EAT) in a sample of middle-aged women (Midlarsky & Nitzburg, 2008). Eating disorders are also often co-morbid with anxiety and/or mood disorders (Bushnell, Wells, McKenzie, Hornblow, et al., 1994; Halmi, Eckert, Marchi, & Sampugnaro, et al., 1991). However this finding was not replicated in a more recent study (Midlarsky & Nitzburg, 2008).

In terms of demographic characteristics, race/ethnicity (Black vs. Hispanic) was not related to eating symptomatology measured by the Eating Disorder Examination Questionnaire (EDE-Q) in a community sample of 120 Black and Hispanic women

Hrabosky & Grilo, 2007). Differences between Blacks and Whites dissipated when other variables including obesity, waist circumference, history of depression, current depressive symptoms, and history of physical or sexual abuse in childhood were taken into account (Marcus, Bromberger, Wei, Brown, & Kravitz, 2007). These findings suggest that ethnicity may not be a fundamental factor accounting for differences in disordered eating behaviors.

Eating Disorders: Binge Eating

Binge eating is defined as eating abnormally high quantities of food in a short period of time and is often associated with a loss of control over eating (ANAD, 2011). Individuals engaging in severe binge eating behaviors report a total lack of control that leads to constant struggles with binge eating while moderate binge eaters report more episodic binges (Gormally, Black, Daston, & Rardin, 1982). Individuals who seek treatment for binge eating may be diagnosed with Binge Eating Disorder (BED) by the *DSM-IV-TR* guidelines (APA, 2000). BED is often co-morbid with obesity with approximately 30 percent of participants in weight loss programs meeting the criteria for BED (ANAD, 2011; Ghaderi, 2010). However, obese individuals with BED differ greatly from obese individuals without BED. Obese individuals with BED were more likely to have major depressive disorder, have more disordered eating habits, and engage in more emotional eating than obese individuals without (Grilo, Masheb, Wilson, Gueorguieva, & White, 2011). Conversely, Barry, Grilo, and Masheb (2003) found no significant differences between obese and non-obese women with BED and depressive symptoms measured by the Beck Depression Inventory (BDI).

Binge eating compared to Bulimia Nervosa. Binge eating is one aspect of Bulimia Nervosa (BN); however, BN also includes compensatory behaviors (e.g. purging, laxative use, excessive exercise) whereas BED does not (Wade, Bulik, Sullivan, Neale, & Kendler, 2000). This factor is associated with additional key differences between BED and BN. BED and BN vary greatly on measures of eating concerns, restraint, shape concerns, self-esteem, and depression with BN being slightly more severe on these dimensions than BED (Roberto et al., 2010). Also binge eating disorder has been found to be more related to distress and less related to restraint compared to bulimia.

With regard to body image, in one study, women with binge eating symptomatology were not as concerned with their weight and shape as women with bulimic symptomatology (Bulik et al., 2000). In contrast, others researchers suggest that concern with body shape and weight is a foundational aspect of all eating disorders including BED (Fairburn, 1997; Striegel-Moore et al., 2001; Wilfley, 2003). It is possible that preoccupation with body shape and weight may be mediated by the obesity that is often co-morbid with binge eating (Striegel-Moore et al., 2001). For example, Barry, Grilo, and Masheb (2003) found that differences in eating disturbances and drive for thinness for individuals with BN and BED depended on obesity status; non-obese individuals with BED were more similar to individuals with BN than obese individuals with BED.

Other differences have emerged when BED and BN are compared. These distinctions between BED and BN include demographic correlates, types of comorbid disorders and response to treatment (Pull, 2004). White women with BED were more likely to have a history of BN than Black women (Pike, Dohm, Striegel-Moore, Wilfley,

& Fairburn, 2001. Conversely Wade et al. (2000) noted some similarities between women with binge eating vs. bulimic symptomatology; they reported similarly low scores in mastery, self-esteem, and optimism and high scores in dependence.

Affect regulation model. The affect regulation model suggests that experiencing negative emotions leads to binge eating which in turn reduces negative emotions by the use of food for distraction and comfort (Polivy & Herman, 1993). In a recent meta-analysis, Haedt-Matt and Keel (2011) concluded that individuals who engaged in binge-eating also had increased negative affect prior to binge eating; negative affect increased after occurrences of binge eating. Furthermore negative affect prior to binge eating was higher for individuals with BED compared to BN, again highlighting differences between these two eating-disordered behaviors (Haedt-Matt & Keel, 2011).

Risk factors. Men and women who report being anxious, depressed, and/or distressed are more likely to report binge eating behaviors (Johnsen, Gorin, Stone, & le Grange, 2003; Massey, 2011). Importantly, thought suppression was found to fully mediate the relationship between anxiety and binge eating and psychological distress and binge eating (Massey, 2011) indicating that individuals are using binge eating to alleviate unpleasant thoughts. However, thought suppression had no effect on the association between depression and binge eating perhaps because binge eating to escape negative feelings but not thoughts (Massey, 2011).

In addition, a link between avoidant and emotion-focused coping strategies and binge- eating has been established in the literature (Almeida, Savoy et al., 2011; Sulkowski, Dempsey, & Dempsey, 2011). For instance, emotion-focused coping partially mediated the association between binge eating and stress in a sample of 147 female

college students (Sulkowski et al., 2011). Avoidant coping, however, was not a significant mediator when emotion-focused coping was controlled (Sulkowski et al., 2011). Another important predictor of binge eating is psychological stress. In fact, stress was a significant predictor even beyond depressive feelings (Freeman & Gil, 2004; Sulkowski et al., 2011). Specific types of stressors are also related to binge eating. For example, individuals who are stigmatized (a specific type of stressor) due to their weight engaged in more binge eating in a sample of 99 female patients at a weight loss treatment clinic (Almeida, Savoy et al., 2011). Similarly, daily life stress predicted higher binge eating behaviors in a sample of college students (Sulkowski et al., 2011). Poor social functioning and high levels of disability have also been found to be associated with greater binge eating (Wilfley, 2003).

In addition to proximal (recent) stressors, distal stressors are also related to binge eating behavior. Grilo and Masheb (2001) found that 83% of a sample of 145 subjects with BED had suffered some sort of childhood maltreatment. Additionally in a study comparing individuals with BED and healthy individuals, individuals with BED reported higher rates of physical and sexual abuse, being bullied, and ethnic and/or racial discrimination (Striegel-Moore, Dohm, Pike, Wilfley, & Fairburn, 2002).

Eating Disorders and Disordered Eating among SMW

Much of the literature regarding eating disorders has focused on heterosexual women with anorexia and bulimia. As a result, little is known about SMW women's experience with eating disorders. Estimates of the prevalence of eating disorders among SMW reveal wide variability. For example, Brown (1987) reported that lesbians have lower rates of eating disorders, specifically anorexia and bulimia, compared to

heterosexual women. However, this finding was based on her clinical experience rather than empirical data. Other researchers identified no differences between heterosexual women and SMW in any eating disorders or symptomatology using different measurement tools (e.g., Feldman & Meyer, 2007; Heffernan, 1996; Heffernan, 1998; Striegel-Moore, Tucker, & Hsu, 1990; Share & Mintz, 2002; Strong et al., 2000;Wagenbach, 1999).. In contrast, using data from the National Latino and Asian American Survey (NLAAS), a survey of 4,488 Latino and Asian American heterosexual and homosexual men and women, Cochran, Mays, Alegria, Ortega, and Takeuchi (2007) reported that Latina and Asian-American lesbian women had a lifetime prevalence of any eating disorder of 1.4% while heterosexual women had a lifetime prevalence of 0.8%. Taken together, most studies suggest that lesbian and heterosexual women do not differ in prevalence rates of AN, BN, and eating disorder attitudes and symptomatology.

Beyond noting similarities and differences in prevalence rates between sexual minority and heterosexual women, it is also important to consider differences among SMW who do and do not exhibit eating disorder symptoms and behaviors. For example, lesbian and bisexual women with an eating disorder were more likely to have a mood disorder than lesbian and bisexual women without an eating disorder (Feldman & Meyer, 2010). The researchers added that lesbian and bisexual women's depression usually developed before or after the eating disorder but not at the same time. In addition, Haines et al. (2008) found a circular pathway between depression and negative eating attitudes, measured by the EAT, where a direct path existed from depression to negative eating attitudes and from negative eating attitudes to depression in a sample of lesbian women. The National Academy of Science (2011) noted that these are striking findings, but

emphasized the need for additional research in this area. Also increased understanding of sexual minority women's health disparities (including mental health and eating disordered behavior was identified as an important area for future research in the recent Institute of Medicine (IOM, 2011) report on sexual minority health.

SMW and Body Image

A number of important differences emerge in terms of body image among SMW vs. heterosexual women. For example, lesbian women were less preoccupied with weight and were happier with their bodies than heterosexual women (Austin et al., 2004; Brand, Rothblum, & Solomon, 1992). Similarly, lesbians internalized cultural attitudes toward appearance less and had higher body esteem regarding sexual attractiveness compared to heterosexual women (Share & Mintz, 2002). In another study, lesbian women were less preoccupied with physical appearance compared to heterosexual women (Strong et al., 2000) and less preoccupied with the physical appearance of their partners (Siever, 1994). Lesbians also reported being less concerned with looking like women in the media (Austin et al., 2004). In addition, the association between self-esteem and body satisfaction was greater for lesbian women in a small college sample compared to heterosexual women (Streigel-Moore, Tucker, & Hsu, 1990).

Others, however, have concluded that lesbian and heterosexual women have similar body shape concerns (Share & Mintz, 2002; Siever, 1994; Strong et al., 2000; Wagenbach, 1999). For instance in one study, lesbian women had slightly lower, yet not significantly different, body dissatisfaction than heterosexual women (Lyders, 1999). Body shame was an important predictor of disordered eating in this study of 160 mixed heterosexual and homosexual men and women for all groups but heterosexual men,

accounting for 29% of the variance in lesbian women, 29% of the variance in gay men, and 38% of the variance in heterosexual women (Lyders, 1999). Additionally, a study of only lesbian women highlighted the presence of body shame concerns in lesbian women (Haines et al., 2008). The study revealed a direct effect between body shame and negative eating attitudes in lesbians. Similarly, body surveillance directly predicted negative eating attitudes and the effect was partially mediated by body shame. Body shame also partially mediated the relationship between depressive symptoms and negative eating attitudes. Although the literature on body image differences between SMW and heterosexual women yields mixed results, more research seems to point to similarities between lesbian and heterosexual women than differences.

The similarities in disturbed eating among SMW may indicate that sexual orientation is not able to alleviate the pressure to be thin caused by society (Lyders, 1999). In a mixed sample of heterosexual and homosexual men and women, Brand, Rothblum, and Solomon (1992) also found that women, regardless of sexual orientation, had greater reports of body dissatisfaction and concern with weight than men. They surmised that gender may be more salient than sexual orientation in regard to concern with body image. However in a somewhat dated detailed literature review, Heffernan (1994) concluded that lesbian women and heterosexual women are very similar in regard to body image and related attitudes.

There is a small degree of difference, but the importance of this difference needs to be investigated further.

SMW and Binge Eating

As mentioned previously, lesbians report engaging in more binge eating behaviors than heterosexual women. In addition, lesbians report less dieting and purging behaviors associated with the increase in binge eating (Bradford & Ryan, 1994). Since lesbians have lower rates of dieting and purging, Striegel-Moore (1993) proposed that there may be a different pathway to binge eating for lesbians than heterosexual women. Perhaps lesbians engage in binge eating as a coping mechanism but do not use compensatory behaviors for weight loss purposes.

Binge eating is clearly associated with lesbians' emotional experiences. For example, lesbian women who engaged in binge eating reported a greater urge to eat associated with anxiety, anger, and depression compared to lesbians who did not engage in binge-eating (Heffernan, 1998). Among these emotions, anger and frustration were most related to urges to eat compared to anxiety and depression. Lesbians also used binge eating for anxiety reduction and as a distraction. Also, lesbians who engaged in binge eating were more likely to use food as a distraction, for comfort, and to reduce anxiety more than lesbians who did not engage in binge eating. Lesbians seem to use binge eating as a response to feelings of depression and other negative emotions as posited by the affect regulation model (Heffernan, 1996).

Extending beyond the connection between emotions and binge eating, Joshua (2002) examined a model of binge eating among lesbians that included lesbian sexual identity, internalization of norms, social support, psychological health, body image concerns, and disordered eating, including binge eating. The only direct effect leading to binge eating in lesbians was body image concerns. However, psychological health,

lesbian sexual identity, social support, and internalized norms indirectly affected binge eating through body image concerns. Level of masculinity-femininity was not directly or indirectly related to binge eating in the model. Poor psychological health predicted symptoms of depression, but it did not predict binge eating either directly or indirectly. Also, feelings of stress in the past month predicted body image concerns (Joshua, 2002). A significant limitation of this study, however, is that stress was measured by a one-item question. That may not have adequately captured different types of stressors (e.g. life stress, minority stress, microaggressions).

Joshua's (2002) model is limited in other ways as well. Although several sexual orientation specific variables were included (e.g., lesbian sexual identity, comfort with one's sexuality, extent of disclosure, time out, and affiliation with the Lesbian, Gay, Bisexual, and Transexual (LGBT) community), there are additional sexual orientation specific variables that need to be explored. Further, Joshua (2002) defined binge eating in a way that did not exclude lesbians who also engaged in compensatory behaviors. In fact, one of the items on the scale used to measure binge eating in their study asked about purging with more purging behavior reflecting a higher binge eating score. Thus, it was not possible to separate out individuals who engaged in binge eating from lesbians who engaged in bulimic behaviors. This could explain why body image concern was directly related to binge eating, and would also explain why depression and distress did not predict binge eating as previous research suggests (cf. Feldman & Meyer, 2010; Grilo & White, 2011).

Although binge eating among lesbians is an important health concern, the empirical literature in this area is limited, and much of it is rather outdated. In fact, most

key studies in this area were published 10 or more years ago. Additional comprehensive models must be developed and tested to advance our understanding in this area. Because SMW are a marginalized and stigmatized group in mainstream heterosexual society, the minority stress model may offer helpful information about key predictors of eating-disordered behavior in this population.

Minority Stress

Meyer (2003) introduced the minority stress model; this model contends that individuals with a minority status may have negative and/or positive mental and physical health outcomes depending on their minority stress experiences and levels of coping and social support. Individuals with a sexual minority identity (e.g., lesbian, gay, bisexual [LGB]), experience unique minority stress processes including internalized homophobia, stigma consciousness, and sexual orientation-based discrimination. An individual's coping, social support, and minority identity characteristics can mediate the relationship between minority stress and negative health outcomes (Meyer, 2003). Studies have demonstrated that minority stressors are directly related to significant distress in gay men and lesbian women (Hatzenbuehler, 2009; Kelleher, 2009; Lewis et al., 2003; Meyer, 1995). Additionally minority stress has been linked with a host of other negative outcomes including depression (Lewis et al., 2003), substance abuse problems (Harmon, 2008), and domestic violence (Balsam & Szymanski, 2005)

Hatzenbuehler (2009) extended this work suggesting that social and individual psychological processes may mediate the relationship between minority stressors and health outcomes. Consistent with Hatzenbuehler's model, Lehavot and Simoni (2011) reported that minority stressors are related to less social support and less spirituality

among SMW. This association was then linked to greater substance abuse and mental health problems demonstrating the importance of various resources and coping mechanisms in handling minority stress.

Stigma Consciousness is the belief that an individual will be stereotyped (Pinel, 1999). Individuals high in stigma consciousness perceive more discrimination toward themselves and their group. Higher levels of perceived stigma were found to be significantly associated with symptoms of distress (Lambert, 2002). Among lesbians, stigma consciousness was positively related with stress, intrusive thoughts, negative mood, and physical symptoms in lesbians (Lewis et al., 2006). Furthermore gay men's and lesbians' perception of rejection because of their sexual identity was related to increased anxiety, depression, and suicide ideation (Kelleher, 2009; Lewis et al., 2003). Although LGB persons may not actually be experiencing discrimination, just the perception of it is detrimental enough.

Internalized homophobia is the internalization of society's negative messages regarding homosexuality by LGBT individuals (Shidlo, 1994). Newcomb and Mustanski (2010) found that LGBT individuals with more internalized homophobia have more mental health issues (especially depression) compared to LGBT individuals with less internalized homophobia. Lesbians' internalized homophobia was also associated with mental health and substance abuse problems and this effect prevailed even when the mediating effect of social support and spiritually was controlled for (Lehavot & Simoni, 2011; Harmon, 2008). Additionally, internalized homophobia was uniquely associated with psychological distress compared with racism in a sample of Asian-American gay men and lesbians (Szymanski & Gupta, 2009). Internalized homophobia may also be

related to other sexual minority stressors. For example, Lewis et al. (2003) reported that stigma consciousness was positively associated with internalized homophobia. However, Lewis et al. (2006) failed to find a significant relationship between stigma consciousness and internalized homophobia. These mixed findings may be related to measurement or sample differences.

Discrimination. LGBT individuals who experience actual discrimination have the greatest levels of distress compared to LGBT individuals who experience no discrimination or proximal discrimination (e.g. expectations of rejection) (Kelleher, 2009). Also, discrimination reported by lesbians is related to physical symptoms, negative affect, and perceived stress (Irwin, 2009; Lewis, 2003; Szymanski, 2006). Szymanksi (2006) added that lesbians who reported high external sexual orientation discrimination experienced significantly lower mental health outcomes regardless of level of internalized homophobia. Additionally SMW who experienced greater discrimination were more likely to also experience substance abuse problems; this effect existed even when accounting for social support and spirituality (Lehavot & Simoni, 2011; McCabe, Bostwick, Hughes, West, Boyd, 2010). Smith and Ingram (2004) investigated the effects of heterosexist events in the workplace on lesbians and found that lesbians who experienced more heterosexist events in the workplace reported greater health problems and lower job satisfactions. Although discrimination is directly related to health outcomes, in one study, the relationship between discrimination and depressive symptoms was partially mediated by social support in Southern lesbians (Irwin, 2009). Therefore, it is also important to consider social factors that may mediated the relationship between minority stress and eating-disordered behaviors.

Social Constraints among SMW

Social constraints are experiences by individuals who have gone through a traumatic event that causes them to feel unsupported by others when reaching out for social support (Lepore, 2002). Lepore et al. (1996) found that bereaving mothers with high social constraints experienced more distress and intrusive thoughts than mothers with low social constraints. Also, adolescents with high social constraints who had been exposed to violence at time 1 experienced more depressive symptoms at time 2 than adolescents with low social constraints (Kaynak et al., 2011).

Social constraints can also be applied to day-to-day stress in addition to traumatic events (Lewis et al., 2006). Lewis et al. (2006) found that social constraints related to discussing sexual orientation were positively related to intrusive thoughts, internalized homophobia, distress, negative mood, and physical symptoms. Social constraints also moderated the relationship between stigma consciousness and the previously mentioned negative outcomes. Lesbians with low social constraints did not significantly differ in negative outcomes depending on level of stigma consciousness. However, lesbians with high social constraints had increasingly higher negative outcomes as they increased in stigma consciousness. Therefore, lesbians with more social constraints and higher stigma consciousness experienced the greatest negative outcomes.

A Proposed Model of Binge Eating among SMW

Lesbian women have a higher prevalence of obesity than heterosexual women (Aaron & Hughes, 2001; Austin et al., 2009; Bowen, Balsam, & Ender, 2008; Case, 2004). In fact, about half of lesbians in one sample were obese (Yancey, Cochran, Corliss, & Mays, 2003). Some researchers have suggested that levels of exercise among lesbian

women can explain the differences, but this has not been substantiated (Bowen, Balsam, & Ender, 2008). Wagenbach (1999) reported that heterosexual women were more devoted to physical fitness than lesbian women. It is imperative to explore alternate explanations for this difference in obesity prevalence, since obesity is a morbid condition linked to a variety of additional health problems. Because many people who engage in binge eating are obese, it is important to investigate factors that may be associated with binge eating in lesbians and explain the higher prevalence of binge eating in lesbians that has persisted in the literature..

The empirical literature on SMW's disordered eating behavior, particularly binge eating, is sparse, and even less is known about potential antecedents and mediators of binge eating in this at-risk population. Research applying the minority stress model and psychological mediation framework to SMW's disordered eating is essential to address this gap in the literature. Most of the research that has explored this relationship has focused on internalized homophobia and general negative eating attitudes. Swearingen (2006) did not find a relationship between eating disorder symptoms and internalized homophobia in lesbian women. However, there was a very low prevalence of eating disorders in the sample and binge eating was not measured apart from other eating disorders. In another study, depressive symptoms mediated the relationship between internalized homophobia and body shame to negative eating attitudes. Also body shame was directly positively related to negative eating attitudes and internalized homophobia was indirectly positively related to body shame through body surveillance (Haines et al., 2008). Once again, the researchers did not focus on binge eating in their model. All in all a number of researchers have asserted that the application of the minority stress model to

the development of disordered eating warrants further research (Feldman & Meyer, 2010; Heffernan, 1994).

The Present Study

Based on reviews of the sexual minority stress and binge eating literatures, the proposed model included five main components: minority stress, barriers, mental health, body shame, and binge eating behaviors. **Minority stressors** included internalized homophobia, stigma consciousness, and actual experiences of discrimination. **Barriers** included social isolation, social constraints, and maladaptive emotion-based coping strategies (e.g. rumination, catastrophizing, and self-blame). **Mental health** included depression, anxiety, behavioral control, and positive affect. Finally, two observed variables, body shame and binge eating, complete the model. The model is primarily derived from the minority stress model, psychological mediation framework, and the affect regulation model (See Figure 1). In addition, because there is some evidence that minority stress, mental health, and binge eating severity varies as a function of sexual identity (i.e., lesbian vs. bisexual; see Austin et al., 2009; Bostwick, Boyd, Hughes, & McCabe, 2010; Cochran & Mays, 2009), sexual identity is an observed variable that warranted inclusion in the proposed model.

Based on this model it was expected that:

1. Sexual identity will be directly related to minority stress and directly related to mental health. Support for these paths derives from the finding that bisexual women are at greater risk for mental health problems (Cochran & Mays, 2009).

2. Minority stress will be directly related to binge eating behaviors. This path is grounded in the minority stress model that predicts that minority stress leads to negative mental health problems (Meyer, 2003).

3. Mental health will mediate the relationship between minority stress and binge eating. This path is grounded in the affect regulation model that predicts that experiencing stressors leads to negative affect, and then to binge eating to alleviate the negative affect (Haedt-Matt & Keel, 2011).

4. Minority stress will be associated with more barriers, which in turn will be associated with negative mental health and finally binge eating behaviors. This path is based on the affect regulation model and Hatzenbuehler's (2009) psychological mediation framework. It is expected that fewer barriers (i.e., social isolation and effective coping) will decrease the impact of minority stressors (i.e., improve mental health) which in turn will decrease binge eating behavior.

5. Body shame will mediate the relationship between minority stress and binge-eating. A previous study found that body shame was an important mediator between sexual identity issues and binge eating in SMW (Haines et al., 2008).

6. The final proposed pathway is a fully mediated model with minority stress predicting more barriers, in turn predicting negative mental health that in turn is associated with body shame, and then finally binge eating behavior. Support for these paths is based on the affect regulation model and Hatzenbuehler's (2009) psychological mediation framework as well as adding body shame based on the mediated relationship found between body shame and mental health on eating disordered behavior (Joshua, 2002).

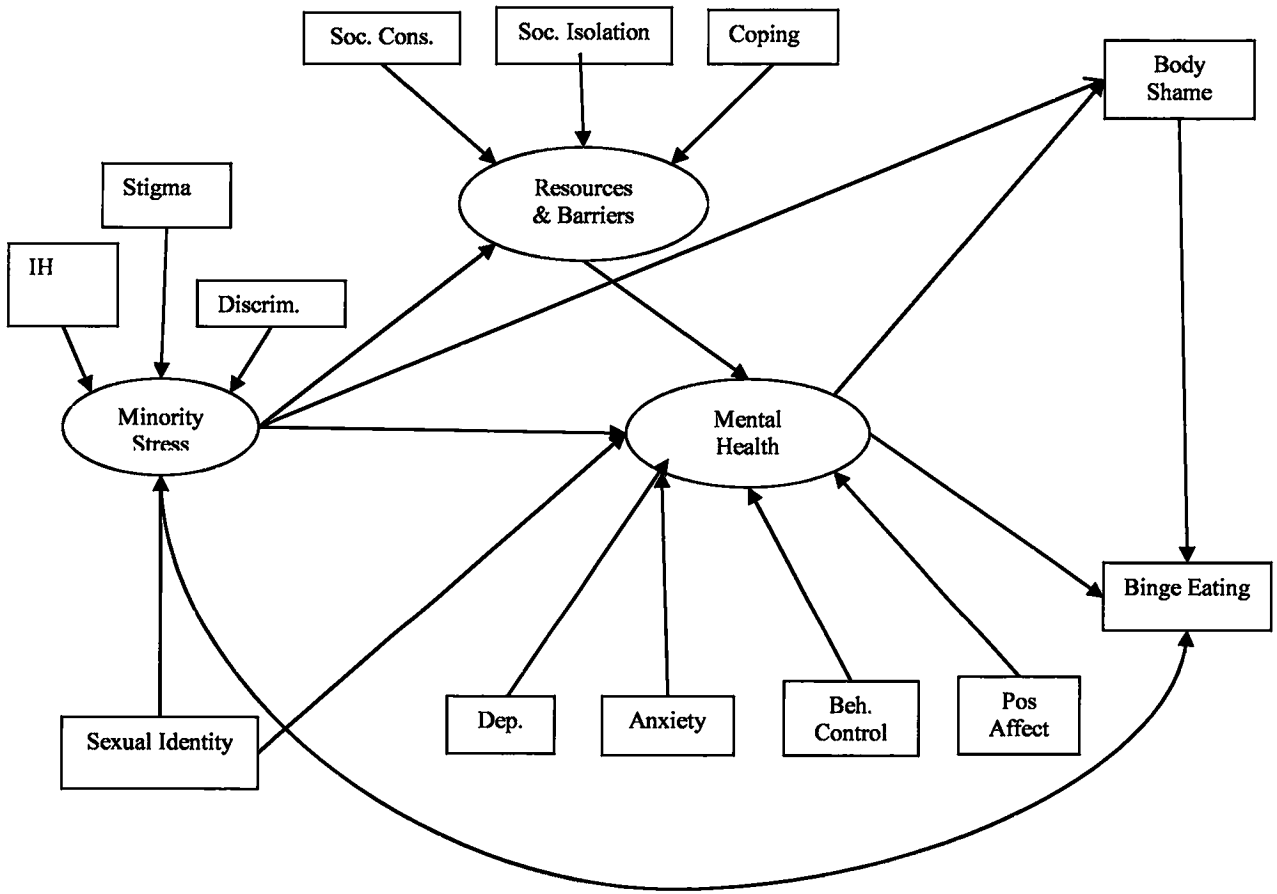

Figure . The Proposed Mediated Model

CHAPTER 2

METHOD

Participants

The study participants were 164 self-identified lesbian and bisexual women, 18-40 years old who have not engaged in any compensatory behaviors as would be indicative of BN. Special effort was made to reach underrepresented racial groups through ethnically targeted Facebook pages and forums. Participants were recruited through the internet by asking "women who are attracted to women" between ages 18 and 40 to complete an online survey about lesbian's health. Participants were recruited through national LGBT organizations, social media, online forums, websites, listservs, and LGBT newsletters. Prior to data collection, the project was reviewed and approved by the College of Sciences Human Subjects Committee. All participants were treated in accordance with the American Psychological Association (APA) guidelines and were eligible to be entered in a raffle for four $25.00 Amazon gift cards.

Measures

A demographic questionnaire (see Appendix A) asked participants about sexual orientation, age, race, height, weight, income, state of residence, and educational level. Also level of outness was assessed. A small health behavior survey was included as well in order to discern if participants have engaged in compensatory behaviors that would be indicative of BN. If they answered yes, they were not allowed to participate in the survey.

Internalized Homophobia Scale – Revised (IHP-R; Herek, 2009). The IHP-R (see Appendix B) measured the internalization of society's negative attitudes toward sexual minorities, or internalized homophobia, in SMW. The scale has five items that

participants rated on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A higher score indicated higher internalized homophobia. A sample item is: "I have tried to stop being attracted to women in general." Herek et al. (2009) reported a Cronbach's alpha of .82. The IHP-R 5-item scale was largely correlated with scores from the longer IHP 9-item scale ($r = .90$), therefore using the 5-item scale should not reduce reliability significantly. IHP-R scores were negatively correlated with age and education level (Herek, Gillis, & Cogan, 2009). In a study of 147 men and women, Herek, Cogan, Gillis, & Glunt (1998) added that men scored significantly higher on the IHP-R than women. The Cronbach's alpha for the IHP-R was .86 in the current study.

Stigma Consciousness Questionnaire (SCQ; Pinel, 1999). The SCQ (see Appendix C) is a 10-item measure that assessed the extent to which LGBT individuals expect to be evaluated based on stereotypes. Higher scores on the SCQ indicated that the respondent perceived more discrimination towards them or their group. Respondents used a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample item is, "Stereotypes about lesbians have not affected me personally." Pinel (1999) reported a Crobach's alpha of .81 and Lewis et al. (2003) reported a Cronbach's alpha of .74. The correlation between the SCQ and trust in others was -.17 and the correlation between the SCQ and self-consciousness was .31 demonstrating some evidence for construct validity (Pinel, 1999). Also the correlation between the SCQ and person discrimination was .35, showing discriminant validity (Pinel, 1999). The Cronbach's alpha for stigma consciousness was .77 in the current study,

Heterosexist Harassment, Rejection, and Discrimination Scale (HHRDS; Szymanski, 2006). The HHRDS (See Appendix D) measured self-reported heterosexist

harassment, rejection, and discrimination. The scale has three subscales: Harassment and Rejection, Workplace and School Discrimination, and Other Discrimination. The Harassment and Rejection subscale asks participants about verbal and physical harassment from friends, family, and others. The Workplace and School Discrimination subscale asks participants about unfair treatment in the work or school setting. The Other Discrimination subscale asks participants about unfair treatment from strangers, people in helping jobs, and people in service jobs. The total HHRDS was used in this study. The HHRDS has 14-items that ask participants to disclose the percentage of time they experienced specific events based on their status as a lesbian from 1 (*never*) to 6 (*almost all of the time*). Higher scores represent more harassment or discrimination. A sample item is: "In the past year, how many times have you been treated unfairly by teachers or professors *because you are a lesbian/gay/bisexual person*?" Szymanski (2006) reported a Cronbach's alpha of .90 for the HHRDS in a lesbian sample. Friedman (2008) reported a Cronbach's alpha of .87 in a mixed lesbian and bisexual population. An exploratory factor analysis indicated that a three-factor structure was appropriate with all items loading singularly on each factor creating the three sub-scales (Szymanski, 2006). Evidence for predictive validity of the HHRDS is supported by positive correlations between the HHRDS and psychological distress ($r = 35$), somatization ($r = .30$), obsessive compulsiveness ($r = .34$), interpersonal sensitivity ($r = .29$), depression ($r = .23$), and anxiety ($r = .37$) (Szymanski, 2006). More evidence for predictive validity is provided by the association of scores on the HHRDS with greater mental health problems and less social-psychological resources (Lehavot & Simoni, 2011). The Cronbach's alpha for the HHRDS was .89 in the current study.

Friendship Scale (FS; Hawthorne, 2006). The Friendship Scale (Appendix E) was used to measure social isolation. The Friendship Scale includes six items and participants use a 5-point scale with responses ranging from 1 (*almost always)* to 5 (*not at all)*. A sample item is, "I feel isolated from other people." Hawthorne (2006) reported a Cronbach's alpha of .83. A sample of 829 adults was recruited to explore the factor structure of the FS; the sample was randomly separated in half. One half was used for the exploratory factor analysis and the other half was used for the confirmatory factor analysis. The exploratory factor analysis demonstrated that all items loading sufficiently on one factor. Good fit was also reported in the confirmatory factor analysis, $\chi^2(7) = 8.18$, $p = 0.32$, CFI = 0.99, RMSEA = 0.02. Concurrent validity was demonstrated by testing the Friendship Scale with known correlates of social isolation; the FS was correlated with the physical well-being ($r = .34$) and psychological well-being ($r = .48$) subscales of the World Health Organization Quality of Life Group's (WHOQOLG). Younger respondents reported greater social isolation than older respondents. The researchers also found evidence for construct validity; the correlation between the FS and the social dimension of the WHOQOL scale was .44 and the correlation for the Assessment of Quality of Life scale (AQoL) was .61 (Hawthorne, 2006). The Cronbach's alpha for the FS was .88 in the current study.

The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2001). The CERQ (Appendix F) measures cognitive emotional coping strategies individuals use after experiencing negative life events. The scale includes nine subscales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming

others. The current study focused on the emotional coping subscales including self-blame, rumination, and catastrophizing. Each subscale only contained two items so a composite score containing all three subscales was created to maximize variability and reliability. The 18-item short form of the CERQ for adults was used. Participants were asked to rate how they generally think when confronted with a negative event using a 5-point scale ranging from 1 (*almost never*) to 5 (*almost always*). A sample item is, "I think that I have to accept that this has happened." The Cronbach's alpha for the scale was found to be .92 (Garnefski, et al., 2001). Multiple regressions using the nine subscales as predictors explained 38% of the variance in depression and 33% of the variance in anxiety providing evidence for predictive validity (Garnefski & Kraaij, 2006). The CERQ has not been used with a SMW population previously. The Cronbach's alpha for the emotion-focused coping composite was .83 in the current study.

Social Constraints Questionnaire. The original Social Constraints measure (Lepore, 2002; Appendix G) measured the degree to which a person was able to talk about a situation with others. It has been applied to multiple situations including bereavement and cancer (Lepore, Silver, Wortman, & Wayment, 1996; Lepore & Helgeson, 1998). Lewis et al. (2006) adapted the scale to measure social constraints regarding lesbian's identity. The scale that Lewis et al. (2006) adapted was adapted further for this study to include social constraints talking with lesbian vs. straight friends as well as family and intimate partners and was bisexual inclusive. Many people did not answer the questions regarding partner; this is most likely due to them not being in a partnered relationship. Also many people did not answer the questions regarding LGB friends. Therefore the intimate partner and LGB friends' subscales were not used. The

other two subscales were consolidated into one total composite score. Friends and family constraints have been combined into a composite score in previous research (Lewis et al., 2006). Participants indicate the difficulty they have talking with others about their sexual orientation using a 6-point scale ranging from 1 (*none of the time)* to 6 (*all of the time).* A sample item is: "When you talked about issues related to being lesbian, how often did your family give you the idea that they/he/she didn't want to hear about it?" A Cronbach's alpha of .80 was reported by Lewis et al. (2006). Lepore (2002) reported good convergent, predictive, and discriminant validity demonstrated by a significant negative correlation between social constraints and mental health (r = -.54), a positive correlation between social constraints and negative affect (r = .41), and no relationship between social constraints and social support (r = .08). Two items were deleted because of poor reliability with the other items. The Cronbach's alpha for the remaining items was .82 in the current study.

Mental Health Inventory (MHI; Veit & Ware, 1983). The MHI (Appendix H) is a widely used measurement of mental health. The MHI has 18 items, including four subscales: anxiety, depression, behavioral control, and positive affect. Participants report on their mood and behavior over the past four weeks on a 6-point scale. The response choices ranged from 1 (*none of the time)* to 6 (*all of the time).* A sample item is: "During the past 4 weeks, how much of the time has your daily life been full of things that were interesting to you?" The Cronbach's alphas for the subscales are .80, .87, .78, .83 for the anxiety, depression, behavioral control, and positive affect subscales, respectively, and .93 for the full scale (Ritvo et al., 1997). Concurrent validity is demonstrated by positive correlation of the MHI with SF- Role Emotional Scale (r = .59), the SIP - Emotional

Behavior Scale (r = .56), and the UCLA Loneliness-Companionship scale (r = .53) (Ritvo et al., 1997). The MHI has not been used with a SMW population previously. The Cronbach's alpha for anxiety, depression, behavioral control, and affect were .86, .90, .84, .87 respectively in the current study.

Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996) The OBCS (Appendix I) measured the degree to which women view their bodies as objects. This 24-item scale includes 3 subscales: body surveillance, body shame, and appearance control beliefs; only the 8-item body shame subscale was used in this study. Respondents used a seven point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample item is "When I can't control my weight, I feel like there is something wrong with me." The Cronbach's alphas for the body shame subscale from two separate studies were .84 and .70 (McKinley & Hyde, 1996). The concurrent validity of the body shame subscale was demonstrated by a negative correlation with body esteem, r = -.51, and a positive correlation with body surveillance, r = .66 (McKinley & Hyde, 1996). This measure has been used previously with SMW (Lyders, 1999) The Cronbach's alpha for the body shame subscale of the OBCS was .83 in the current study.

Binge-Eating Scale (BES; Gormally et al., 1982). The BES (Appendix J) is an instrument that measures binge-eating severity. The scale was created in three steps (1) specifying the characteristics of binge eating resulting in 16 characteristics, (2) developing statements that include a range in severity of each of the characteristics, and (3) an external criterion was developed. (Gormally et al., 1982). The external criterion was assessments of binge-eating severity (none, moderate, or severe) made by trained interviewers; the comparison between the BES and the interviewer's assessments of

severity revealed significant higher scores on the BES for severe followed by moderate (Gormally et al., 1982).

In previous research, correlations between the BES and objective and subjective combined food intake journals were .42 for binge calories, .46 for binge days, and .48 for binge episodes (Timmerman, 1999). This demonstrated that the BES is useful for measuring uncontrolled eating. Also, previous research determined that BES scores were not related to participants' total caloric intake implying that the BES is measuring true uncontrolled binge eating as opposed to just eating a large amount of calories (Timmerman, 1999). The Cronbach's alpha for the BES was found to be .89 (Freitas, Lopes, Appolinario, & Coutinho, 2006). The BES has not been used with SMW previously. The Cronbach's alpha for the BES was .88.

Participants were given 16 groups of statements and instructed to indicate the statement in each group that best describes how they felt. Each item has three to four statements and each statement is assigned a value between zero and three. Higher scores indicated more severe binge eating behaviors. A sample item is "I have no difficulty eating slowly; I may eat quickly, but I never feel too full; sometimes after I eat fast I feel too full; usually I swallow my food almost without chewing, then feel as if I ate too much."

Procedure

Participants accessed the survey through an online link created with a survey management system and completed the questionnaires from a computer at the location and time of their own choice. No identifying information was obtained, so all surveys were submitted anonymously. Respondents were allowed to skip any question that they

did not feel comfortable answering. At the end of the survey a list of resources and their contact information was provided for any participants that wanted additional information and/or assistance in accessing resources. Participants were directed to a separate link where they were able to enter their e-mail information to enter the raffle. This information could not be associated with their responses in any way.

CHAPTER 3

RESULTS

Overview of Analyses

Structural Equation Modeling (SEM) with Mplus 5.2 was used to analyze the proposed model (Muthén & Muthén, 2008). The data were cleaned and assumptions were checked. After the data were deemed proper, SEM was used to estimate the model. The model was checked for overall fit using several fit indices including the Tucker Lewis Index (TLI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) index, and the Standardized Root Mean Squared (SRMS) index. The path coefficients of the models were examined to determine how well the variables explained the model. As appropriate, the model was modified based on theory and calculated statistics. The initial model is presented in Figure 1.

The proposed model had three main paths that are of interest. These paths were developed in accordance with the minority stress model, the psychological mediation framework, and the affect regulation model.

Power Analysis

A power analysis based on the model in Figure 1 was conducted. Based on the criteria of close fit with RMSEA, the analysis indicated that .80 power is achieved with 57 degrees of freedom and 195 participants (MacCallum, Browne, & Sugawara, 1996).

There were 208 initial responses to the survey. Forty-four people indicated engaging in a compensatory behavior after binging and were not eligible to complete the survey. This resulted in obtaining 84% (164 participants) of the needed sample size.

However, because all resources were used in obtaining the initial sample of participants, further participants could not be recruited.

Demographics

The demographics of the sample are displayed in Table 1. The majority of the sample identified as lesbian, mostly lesbian, or bisexual; there were some participants who identified as other (including queer, pansexual, heteroflexible, and fluid).The sample ranged from 18 to 40 years old with over 75% in the 18-25 year-old range. The sample was relatively diverse with respect to race and ethnicity with more than 35% of the participants indicating a "non-White" race. The sample was also well-educated with more than 80% reporting education beyond high school. In terms of sexual attraction, 40% of SMW reported being attracted only to women, 43% reported mostly women, 12% reported equally men and women, and 5% reported mostly men.

Preliminary Analyses

The descriptive statistics of the variables in the model are displayed in Table 2. Participants reported relatively low levels internalized homophobia and were mostly "out," Internalized homophobia scores of 10 were reported for over 75% of the sample. Also 37% reported being completely out of the closet, 33% reported being out of the closet most of the time, 17% reported being half in half out, 10% reported being in the closet most of the time, and 3% reported definitely being in the closet. In addition, participants reported low frequency of binge eating behaviors. A binge eating score of 13 was reported by 75% of the respondents.

Participants were asked about a few health behaviors as well. Smoking cigarettes often was reported by 8% of women, smoking cigarettes sometimes was reported by 6%

Table 1

Demographic Variables

Variable	*N*	%
Sexual Orientation		
Lesbian Only	68	41.5
Mostly Lesbian	48	29.3
Bisexual	35	22.0
Other	12	7.3
Age		
18-25	123	75.5
26-30	25	15.3
31-35	12	7.4
36-40	5	1.8
Latin/Hispanic Origin		
Yes	21	12.9
No	141	86.5
Race		
White	102	62.6
Black	21	12.9
American Indian or Alaskan Native	3	1.8
Asian	6	3.7
Other	3	1.8
Multiracial	26	16

Table 1 Continued

Variable	*N*	%
Education		
More than Bachelor's Degree	21	12.8
Bachelor's Degree	53	32.5
Associate's Degree/Some College	65	39.9
High School Diploma	20	12.3
Less than High School Diploma	3	1.8
Locality		
Urban	79	48.5
Suburban	66	40.5
Rural	17	10.4

Table 2

Descriptive Statistics of Variables

Variable	*N*	*M*	*SD*	Min	Max	Skew	Kurtosis
Minority Stressors							
Discrimination	163	28.45	10.59	14	84	.71	-.15
Internalized Homophobia	163	8.07	4.22	5	25	1.66	2.48
Stigma Consciousness	163	40.50	10.03	10	70	-.30	-.07
Outness	163	2.12	.765	1	5	.39	.39
Barriers							
Social Constraints	163	28.86	6.86	10	60	.24	-.47
Emotion-focused Coping	163	16.86	5.47	6	30	.21	-.35
Social Isolation	163	13.46	5.65	6	30	.87	.27
Mental Health							
Anxiety	163	16.69	5.48	5	30	.10	-.78
Behavioral Control	163	10.91	4.63	4	24	.47	-.68
Depression	163	11.76	4.77	4	24	.40	-.73
Body Shame	163	23.46	9.62	7	49	.32	-.79
Binge Eating	163	9.35	8.09	0	46	1.09	.59

of women, smoking cigarettes rarely was reported by 14% of women, and smoking cigarettes never was reported by 75% of women. Drinking alcohol often was reported by 15% of women, drinking alcohol sometimes was reported by 46% of women, drinking alcohol rarely was reported by 30% of women, and drinking alcohol never was reported by 9% of women. Exercising often was reported by 36% of women, exercising sometimes was reported by 48% of women, exercising rarely was reported by 14% of women, and exercising never was reported by 2% of women. Overeating often was reported by 9% of women, overeating sometimes was reported by 46% of women, overeating sometimes was reported by 37% of women, and overeating never was reported by 8% of women.

Table 3 presents the correlations between the measured variables. Bivariate correlations revealed that among the sexual orientation specific variables, only stigma consciousness was correlated with binge eating. Binge eating was significantly associated with all the mental health variables, as well as social isolation, emotional coping, and body shame.

Model Specification

Figure 1 displays the specified model. "Minority Stress" is a latent variable that includes internalized homophobia, stigma consciousness, and actual sexual orientation discrimination (Meyer, 1995). Resources are an important mechanism that has historically included social factors and coping. Social constraints and emotional coping were added in addition to social isolation, because they have been shown to be important barriers (Heffernan, 1996; Lewis, 2006). Thus the "Barriers" latent variable was developed. The final latent variable is "Mental Health" which is comprised of depression,

Table 3

Correlation Matrix

	IH	Stigma	Outness	Isolation	Coping	Const	Anxiety	Control	Depress	Shame	Binge
Discrim	-.04	.25**	.01	.10	-.01	.42**	.08	.12	.10	.08	.14
IH		.22**	.48**	.28**	.16*	.11	.11	.22**	.16*	.33**	.15
Stigma			.30**	.34**	.19*	.27**	.16*	.21**	.18*	.27**	.25**
Outness				.25**	.15*	.30**	.24**	.18*	.27**	.21**	.04
Isolation					.30**	.28**	.38**	.61**	.57**	.37**	.21**
Coping						.14	.42**	.41**	.44**	.36**	.26**
Const							.30**	.22**	.30**	.06	.02
Anxiety								.70**	.75**	.29**	.27**
Control									.82**	.41**	.35**
Depress										.38**	.32**
Shame											.58**

Note. IH = Internalized Homophobia; Stigma = Stigma Consciousness; Coping = Emotion-focused Coping; Const = Social Constraints.
*Correlation is significant at the 0.05 level. **Correlation is significant at the 0.01 level.

anxiety, behavioral control, and positive affect all of which were measured by the MHI (Veit & Ware, 1983).

Data Cleaning and Assumptions

Data cleaning was conducted by checking for outliers, normality, multicolinearity, and missing data. Boxplots were used to examine the data for univariate outliers; no significant outliers were found. Multivariate outliers were investigated by looking at mahalanobis distances, standardized deleted residuals, and Cook's D values. A few cases were extreme on each value indicating the possibility of multivariate outliers. These cases represented a potential problem in creating biased estimates.

Normality was checked by creating histograms of the variables and calculating skewness and kurtosis estimates (see Table 2). Inspection of the histograms revealed potential problems with the distributions of the following variables: discrimination, IH, binge eating, outness, and social isolation. Since the assumption of normality was not met for all variables and in order to reduce the effect of possible outliers, SEM estimates were bootstrapped (Mooney & Duval, 1993). Bootstrapping approximates the sampling distribution of a statistic and results in robust standard errors (Signh & Xie, 2008).

Multicollinearity was an issue for the mental health latent variable. Therefore the affect indicator was removed first due to having the strongest correlation with the other indicators. After the affect indicator was removed, there were no additional multicollinearity problems.

Lastly, the data were examined for missing data. Among the used variables, .34% of the data were missing. The EM algorithm with single placement was used to replace missing values and create a full data set (Dempster, Laird, & Rubin, 1977). This method

was chosen over other missing data replacement methods because it allowed for the bootstrapping of estimates and for individual indirect effects to be calculated and for the ability to create a full data set with all values.

Model Estimation

The first model (see Figure 1) had poor model fit, $\chi^2 = 110.02, p < .001$, CFI = .90, TLI = .87, and RMSEA = .09 (Hooper, Coughlan, & Mullen, 2008). Internalized homophobia and stigma consciousness loaded well onto the minority stress latent variable with factor loadings of .44 and .54 respectively; however, discrimination loaded poorly with a factor loading of .24. Social isolation and emotion-focused coping loaded onto the barriers latent variable well with factor loadings of .73 and .52 respectively; however, social constraints had a much lower factor loading of .36 (See Figure 2 for estimates).

Anxiety, behavioral control, and depression loaded well onto the mental health latent variable with standardized estimates of .80, .89, and .93 respectively. As mentioned earlier, affect was removed due to multicollinearity.

Tabachnick and Fidell (2007) stated that a loading of .32 would be equated as poor and .45 would be equated as fair. Therefore it was determined that discrimination and social constraints loaded poorly onto their respective latent variables and so were removed from the latent variables as indicators.

Based on the psychological mediation framework and minority stress theory, some parts of the model were re-specified. Discrimination was removed from the minority stress latent variable and outness was added in its place; the latent variable was renamed proximal minority stress. This change is supported by the psychological

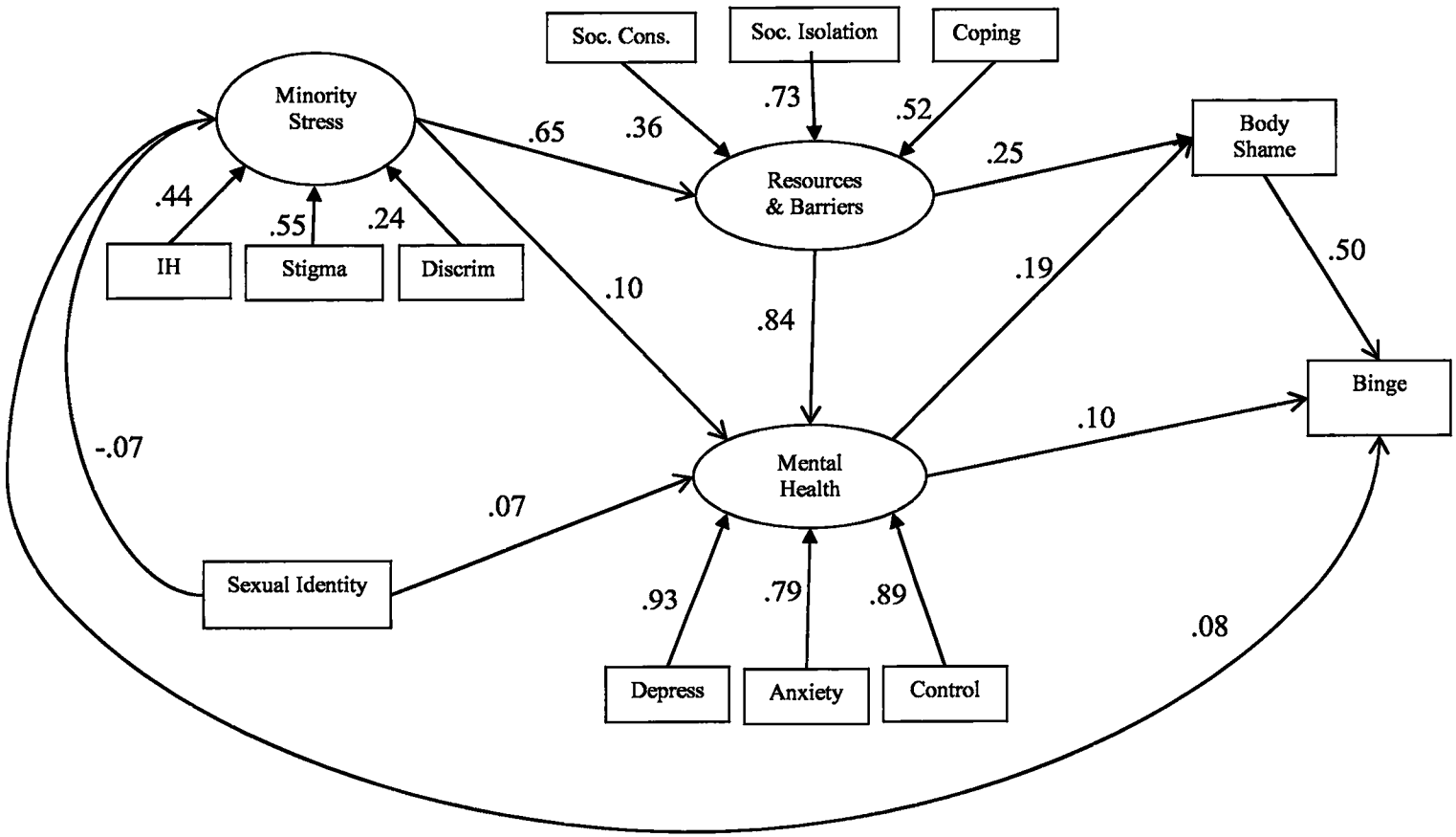

Figure 2. Model 1 with standardized coefficients

mediation framework that includes proximal minority stressors as one latent variable (Hatzenbuehler, 2009). Discrimination was re-added to the model as a separate observed variable. This is consistent with Meyer's (2003) differentiation between discrimination as a distal minority stressor and the other proximal stressors described above.

In addition, social constraints did not fit well with coping and social isolation so it was removed from the barriers latent variable. The barriers latent variable was then removed and emotion focused-coping and social isolation were added as observed variables. Emotion-focused coping and social isolation remained in the same place with the same paths as the previous barrier latent variable. A covariance was added between emotion-focused coping and social isolation.

Two new paths were added to the model based on theory. The first path was from discrimination to social constraints and the second path was from social constraints to proximal minority stress. These paths are consistent with the psychological mediation framework in which distal stressors (i.e., discrimination) are related to proximal minority stress through resources. In addition, another study found that the relationship between distal and proximal minority stressors was mediated specifically by LGBT resources including social constraints (Mason, Lewis, Padilla, & Derlega, Unpublished Data). Model 2 is presented in Figure 3. All path coefficients and bias-corrected (BC) confidence intervals for model 2 are presented in Table 4.

Model 2 demonstrated slightly better model fit, $\chi^2 = 103.81, p < .001$, CFI = .93, TLI = .90, RMSEA = .08, and SRMR = .06. Internalized homophobia, stigma consciousness, and outness all loaded well onto the proximal minority stress latent variable with estimates of .60, .45, and .70 respectively. Also anxiety, behavioral control

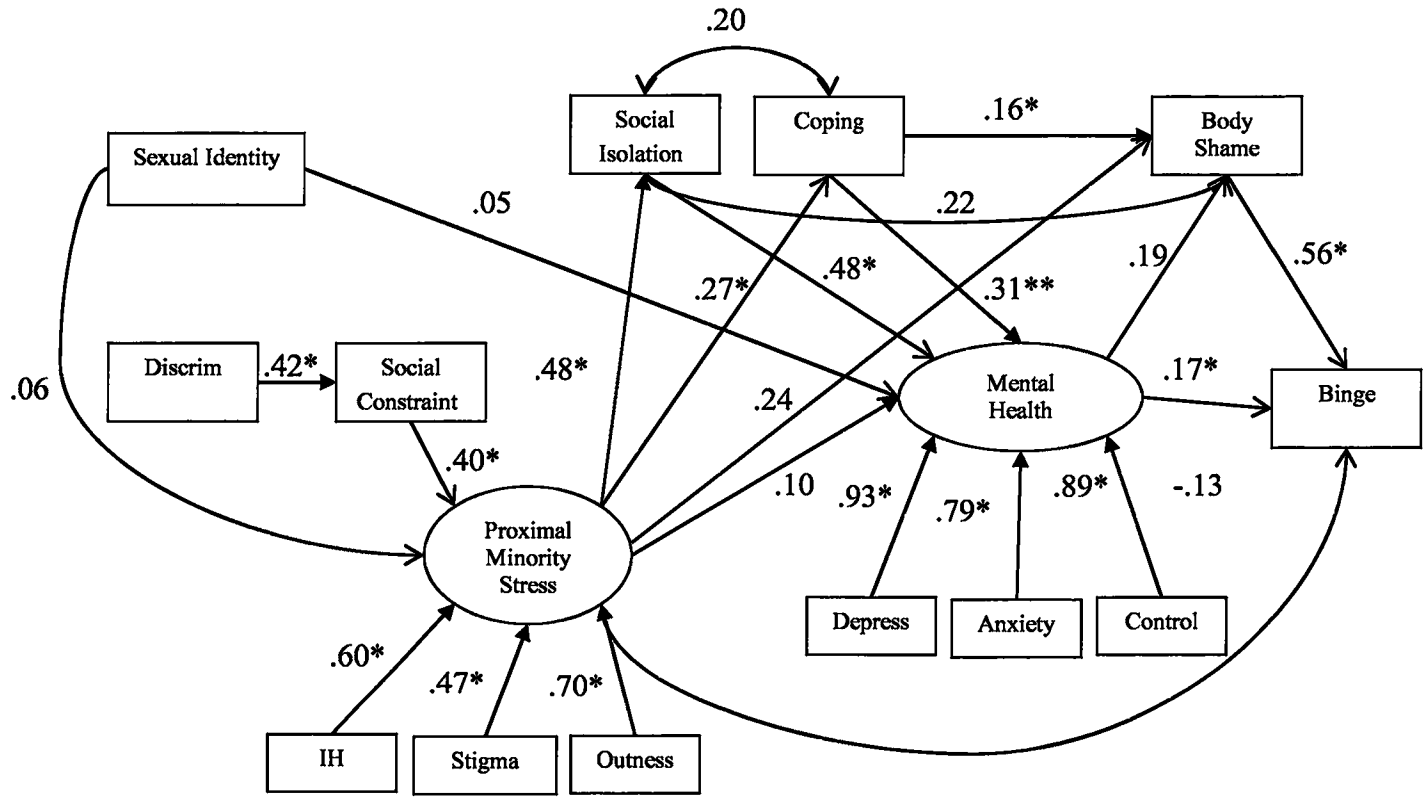

Figure 3. Model 2 with standardized path coefficients. Significance is based off of bootstrapped CI.

*Indicates CI does not include 0

Table 4

Model 2 Path Estimates with Bootstrapped SEs and CIs

Path	*β*	*B*	*SE*	*95% CI*
Direct Paths				
Identity→PMS	.06	.01	03	[-.04, .06]
Identity→MH	.05	.01	.01	[-.02, .03]
Discrim→Constraints	.42	.27	.05	[.18, .37]
Constraints→PMS	.40	.15	.04	[.07, .24]
PMS→Isolation	.47	1.06	.52	[.56, 2.42]
PMS→Cope	.27	.59	.36	[.11, 1.47]
PMS→Shame	.23	.87	1.88	[-.32, 2.39]
PMS→MH	.10	.17	.32	[-.34, .67]
PMS→Binge	-.13	-.40	.51	[-1.22, .39]
Isolation→MH	.48	.37	.08	[.23, .51]
Isolation→Shame	.10	.16	.27	[-.22, .60]
Cope→MH	.31	.25	.06	[.12, .37]
Cope→Shame	.18	.31	.18	[.03, .61]
MHI→Shame	.19	.41	.31	[-.13, .88]
MHI→Binge	.17	.32	.15	[.05, .65]
Shame→Binge	.56	.47	.08	[.33, .64]
Indirect Paths				
Discrim→Constraints→PMS	.17	.04	.01	[.02, .07]
PMS→Isolation→MH	.04	.23	.08	[.19, .95]
PMS→Cope→MHI	.02	.08	.04	[.03, .42]
PMS→MHI→Binge	.02	.05	.44	[-.07, .40]
PMS→Isolation→MH→Binge	.04	.13	.13	[.02, .42]
PMS→Cope→MH →Binge	.02	.05	.05	[.01, .21]
PMS→Shame→Binge	.13	.41	.99	[-.13, 1.22]
PMS→Isolation→MH→Shame→Binge	.02	.08	.21	[-.01, .29]
PMS→Cope→MH→Shame→Binge	.01	.03	.07	[-.01, .13]
MHI→Shame→Binge	.10	.19	.16	[-.05, .45]

Note. Discrim = discrimination; PMS = proximal minority stress; MH = mental health

and depression all loaded onto the mental health latent variable well with estimates of .80, .89, and .93 respectively. The model accounted for the following proportion of variance in the endogenous variables: social constraints $R^2 = .18$, proximal minority stress $R^2 = .16$, social isolation $R^2 = .22$, emotion-focused coping $R^2 = .07$, mental health $R^2 = .48$, body shame $R^2 = .27$ and binge eating $R^2 = .37$.

Hypothesis Testing

In order to test the hypotheses, standardized path coefficients were used to compare path strength and effect. However, the bootstrapping procedure was used to look at significant direct and indirect paths. The bootstrapping procedure computed BC confidence intervals for direct effects and indirect effect; if zero was not included in the interval than it was significant. Both 95% and 99% BC confidence intervals were computed.

Hypothesis 1 predicted that sexual identity would be directly related to minority stress and to mental health. This hypothesis was not supported by the data. Sexual identity did not significantly predict proximal minority stress, see Table 4. Also, sexual identity did not significantly predict mental health, see Table 4. Since sexual identity did not add anything to the model, it was removed for parsimony (see Figure 4 for model 3) Bootstrapped estimates and BC confidence intervals for the final model are presented in Table 5.

Hypothesis 2 predicted that minority stress would be directly related to binge eating behaviors. This hypothesis was not supported. The direct path associating proximal minority stressors and binge eating was not significant (see Table 5).

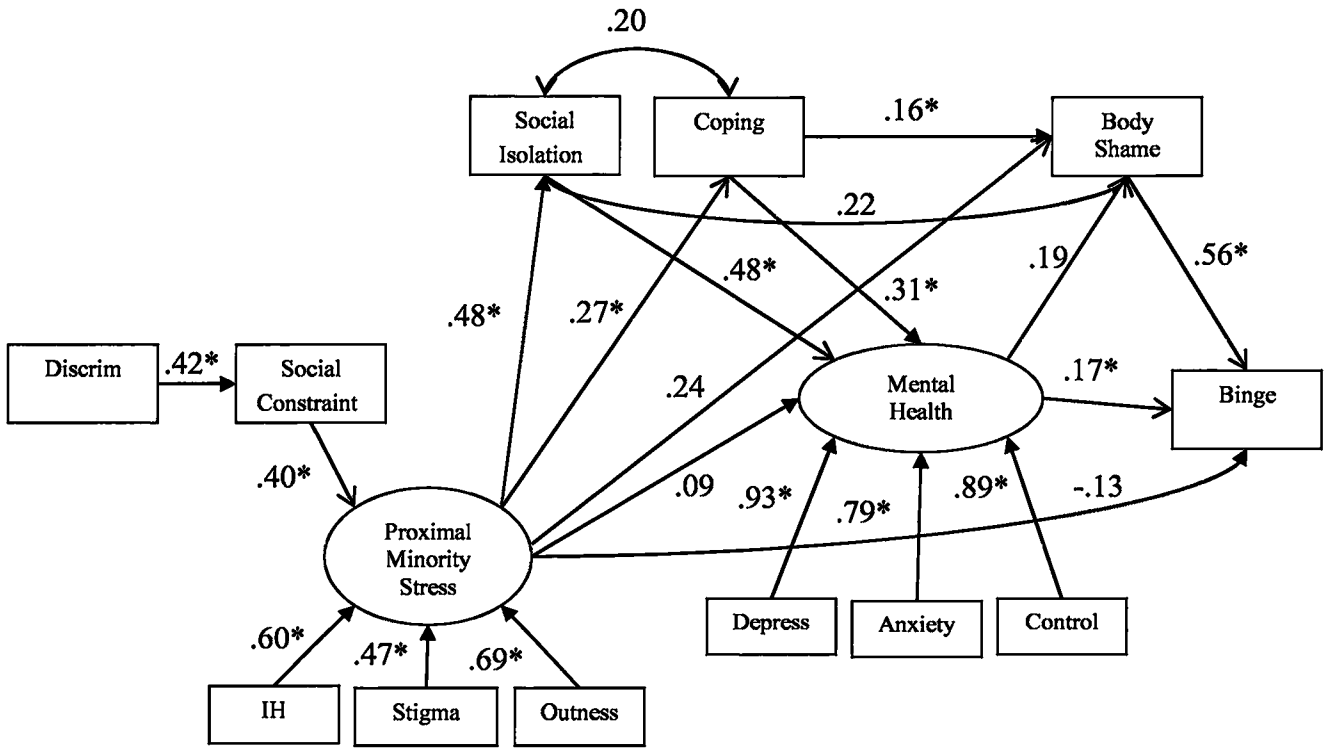

Figure 4. Model 3 with standardized path coefficients. Significance is based off of bootstrapped CI.

*Indicates CI does not include 0

Table 5

Model 3 Path Estimates with Bootstrapped SEs and CIs

Path	β	B	SE	95% CI
Direct Paths				
Discrim→Constraints	.42	.27	.05	[.18, .37]
Constraints→PMS	.40	.15	.04	[.07, .24]
PMS→Isolation	.48	1.07	.48	[.57, 2.29]
PMS→Cope	.27	.598	.36	[.11, 1.45]
PMS→Shame	.24	.89	1.23	[-.29, 2.32]
PMS→MH	.19	.16	.30	[-.34, .66]
PMS→Binge	-.13	-.41	.50	[-1.21, .39]
Isolation→MH	.48	.37	.07	[.23, .50]
Isolation→Shame	.09	.16	.22	[-.22, .59]
Cope→MH	.31	.25	.06	[.12, .36]
Cope→Shame	.18	.31	.16	[.03, .61]
MH→Shame	.19	.41	.27	[-.13, .88]
MH→Binge	.17	.32	.15	[.05, .63]
Shame→Binge	.56	.47	.08	[.33, .64]
Indirect Paths				
Discrim→Constraints→PMS	.17	.04	.01	[.02, .07]
PMS→Isolation→MH	.04	.23	.08	[.19, .95]
PMS→Cope→MH	.02	.08	.04	[.03, .42]
PMS→MH→Binge	.02	.05	.42	[-.07, .38]
PMS→Isolation→MH→Binge	.04	.13	.13	[.02, .42]
PMS→Cope→MH→Binge	.02	.05	.04	[.01, .20]
PMS→Shame→Binge	.13	.42	.62	[-.11, 1.20]
PMS→Isolation→MH→Shame→Binge	..02	.08	.11	[-.01, .28]
PMS→Cope→MH→Shame→Binge	.01	.03	.04	[-.01, .14]
Isolation→MH→Binge	.08	.12	.06	[.02, .26]
Cope→MH→Binge	.05	.08	.04	[.02, .18]
MH→Shame→Binge	.10	.19	.14	[-.05, .45]

Note. Discrim = discrimination; PMS = proximal minority stress; MH = mental health.

Hypothesis 3 predicted that mental health would mediate the relationship between minority stress and binge eating. This hypothesis was not supported. The path from proximal minority stressors to mental health was non-significant. The path from mental health to binge eating was significant. However since both paths were not significant there is no mediation effect between minority stress and binge eating mediated through mental health. Also there was not a significant indirect path associating proximal minority stressors to binge eating through mental health (see Table 5).

Hypothesis 4 predicted that minority stress would be associated with more barriers which in turn would be associated with negative mental health and ultimately binge eating behavior. This hypothesis was supported. There was a significant indirect path from minority stress to binge eating through social isolation and mental health. In addition, there was a significant indirect path from minority stress to binge eating through emotion-focused coping and mental health (see Table 5).

Hypothesis 5 predicted that body shame would mediate the relationship between minority stress and binge eating. This hypothesis was not supported. There was not a significant path from minority stress to body shame; although, the strength of the standardized path coefficient was .24. Also body shame did not significantly mediate the relationship between minority stress and binge eating (see Table 5).

Hypothesis 6 predicted a fully mediated model with minority stress predicting more barriers, in turn predicting negative mental health, then body shame, and finally binge eating behavior. This hypothesis was not supported. There was not a significant

indirect effect from minority stress to binge eating through social isolation, mental health, and body shame. Also there was not a significant effect from minority stress to binge eating through emotion-focused coping, mental health, and body shame (see Table 5).

Although not originally hypothesized, social constraints did significantly mediate the relationship between discrimination and proximal minority stressors (see Table 5).

Summary

The final model demonstrated adequate model fit, $\chi^2 = 93$, $p < .001$, CFI = .93, TLI = .90, RMSEA = .08, and SRMR = .06 (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999; Steiger, 2007). The chi-squared statistic is generally very sensitive to sample size. Therefore due to the low sample size in the study, the other model fit statistics were better indicators of the fit of the model. The CFI was deemed acceptable (Hu & Bentler, 1999). The TLI did not quite reach the recommended cutoff of .95 (Hu & Bentler, 1999). The RMSEA was slightly higher than the stringent upper limit of .07 set by recent authors (Steiger, 2007). Lastly the SRMR was within acceptable limits (Hu & Bentler, 1999). The modification indices did not suggest any additional model changes in order to significantly improve model fit. The proportion of variance in the endogenous variables is as follows: social constraints $R^2 = .18$, proximal minority stress $R^2 = .16$, social isolation $R^2 = .22$, emotion-focused coping $R^2 = .07$, mental health $R^2 = .48$, body shame $R^2 = .27$, and binge eating $R^2 = .37$ .Removing sexual identity from the model did not change any R^2 estimates. The remaining hypotheses were analyzed. See Table 5 for path estimates, standard estimates, and bootstrapped BC confidence intervals.

Although several of the specific hypotheses were not supported, there were two main paths of interest that were significant. Proximal minority stressors were related to

binge eating behaviors mediated by social isolation, emotion-focused coping, and mental health. Also proximal minority stressors were related to mental health problems through social isolation and emotion-focused coping. These results support the minority stress model, the psychological mediation framework, and the affect regulation model.

CHAPTER 5

DISCUSSION

The goal of this study was to develop and test a model connecting the unique stressors that SMW experience with the propensity to engage in binge eating behavior. The model was developed based on the Minority Stress Model (Meyer, 1995) and the Psychological Mediation Framework (Hatzenbuehler, 2009). These models demonstrate the association of minority stress and negative health outcomes (Meyer, 2003) and emphasize the importance of considering mediators of this relationship (Hatzenbuehler, 2009). This network of mediators includes important psychological constructs such as resources, barriers, and individual traits. The proposed model included these mediating variables as steps on the path to negative health outcomes and binge eating.

Another important theoretical framework considered in this research was the affect regulation model (Haedt-Matt & Keel, 2011; Herman & Polivy, 1993). This model posits that stressful events can lead individuals to develop negative affect and in turn to engage in binge eating to regulate those negative feelings. Specifically, those who used more emotional coping mechanisms and had less social support were more inclined to engage in binge eating behaviors (Sulkowski et al., 2011). The proposed model in this study investigated if minority stress would lead to binge eating as predicted by the affect regulation model.

There has been increasing emphasis on reducing obesity and improving the health of SMW. The U.S. Department of Health and Human Services (HHS) has recently taken actions to improve the health of SMW including increased research and new policies (HHS, 2012). Also the Agency for Healthcare Research and Quality (AHRQ) has

supported research aimed at reducing obesity in SMW (AHRQ, 2011). Although SMW consistently have higher BMIs (Aaron & Hughes, 2001; Austin et al., 2009; Bowen, Balsam, & Ender, 2008; Case, 2004; Smith et al., 2010), prior research on binge eating in SMW has seldom examined *why* SMW engage in binge eating behaviors. Drawing upon the minority stress, psychological mediation, and affect regulation models, this study tested a model of pathways to binge eating among SMW. Understanding pathways to binge eating is essential to improving sexual minority women's health. As these pathways are illuminated, it will ultimately be possible to develop prevention and intervention strategies to improve SMW's health.

Discrimination and Proximal Stressors

The minority stress model predicted that discrimination would be related to proximal stressors such as internalized homophobia and expectations of rejection and discrimination. In contrast to these expectations, discrimination was not directly related to proximal minority stressors. Discrimination was, however, directly related to social constraints regarding one's sexual identity. These difficulties in talking with others about sexual orientation and relationship strain were in turn related to proximal minority stress. Social constraints significantly fully mediated the relationship between discrimination and proximal minority stress. Thus, among SMW, experiences of discrimination activate difficulty talking with others about sexual orientation and relationship strain, in turn increasing proximal stressors such as internalized homophobia, concealment, and expectations of rejection/discrimination. These results are consistent with another study in which social constraints mediated the relationship between harassment and proximal minority stress in a sample of LGBT adults (Mason, Lewis, Padilla, & Derlega,

Unpublished data). In another study, however, Lehavot and Simoni (2011) found significant small correlations between LGB victimization and IH and concealment although they did not examine mediators.

This important finding provides preliminary evidence that discrimination regarding one's sexual identity does not directly relate to proximal minority stressors. Rather, this discrimination activates difficulty talking with others about sexual identity, ultimately creating more minority stress. Thus, if SMW have family and friends with whom they can discuss their experiences of discrimination and sexual orientation, their stress level should decrease. It is important to note that this goes beyond simply social support which would be expected to decrease stress. For SMW it is not enough to have people to talk to, it is essential that they can talk to others *about their sexual orientation.* This specific type of social interaction will in turn reduce proximal minority stressors.

Proximal Stressors and Mental Health Outcomes

Proximal minority stress was related to increased social isolation and more emotion-focused coping. Social isolation and emotion-focused coping were significantly related to more negative mental health outcomes. Considering these paths together, social isolation and emotion-focused coping significantly mediated the relationship between proximal minority stress and mental health. Thus, proximal stressors such as internalized homophobia, stigma consciousness, and concealment activate social isolation and emotion-focused coping, in turn increasing depression, anxiety, and decreasing behavioral control. These findings are consistent with the Psychological Mediation Framework (Hatzenbuehler, 2009). Individuals who experience these minority stressors

tend to use emotional-coping strategies to cope with the stressors and/or become isolated from society which leads to negative mental health outcomes.

Supportive social networks can assist with buffering stress and maintaining good mental health among LGBT individuals (Hatzenbuehler, 2009; Herek & Garnets, 2007; Lehavot & Simoni, 2011; Szymanski, 2001). Therefore when proximal stressors activate social isolation, SMW do not access this important resource, in turn increasing negative mental health outcomes. After SMW experience these minority stressors, they may isolate themselves from society in order to avoid potential rejection in the future (Link, Struening, Rahav, Phelan, & Nuttbrock, 1997). Also SMW may decide to conceal their identity and isolate themselves from parts of society to protect their identity from becoming compromised (Pachankis, 2008). Further, memories of social rejection can lead to individuals avoiding future social interactions (Higgins, King, & Mavin, 1982). Therefore SMW who expect to be rejected and stigmatized may be more inclined to isolate themselves to avoid the actual rejection.

Regarding emotion focused coping (e.g. rumination, self-blame, and catastrophizing), thinking that one may be victimized in the future or that one is at fault for the stress that they are experiencing leads to more mental health problems (Szymanski & Owens, 2008). When SMW repetitively focus on their identity and potential stigmatization, then they are more likely to ruminate (Nolen-Hoeksema, 2011). Rumination is a strong predictor of negative mental health outcomes; therefore, it is not surprising that ruminating on minority stressors would lead to these symptoms (Nolen-Hoeksema, 2011). Another aspect of emotion-focused coping is catastrophizing. With the existence of hate crimes and other victimization directed at LGBT individuals, SMW

may develop a belief that the world is an unsafe place for them and that bad things are likely to happen to them.

Overall, the mediating role of social isolation and emotion-focused coping are consistent with previous research and offer insight as to a pathway by which minority stress relates to negative mental health outcomes. The cognitive and social strategies SMW use to deal with this stress directly impact on mental health outcomes. Those SMW who isolate themselves, ruminate, and catastrophize will feel worse; conversely, those who affiliate with others and place and are able to use more effective cognitive coping strategies will likely feel and function better.

Predictors of Binge Eating

The primary purpose of this study was to examine pathways to binge eating. Results indicated that social isolation, emotion-focused coping, and mental health mediated the relationship between proximal minority stress and binge eating. This is consistent with the affect regulation model and previous research in which stressful experiences (e.g. weight stigma, life stress) can lead to negative affect which in turn leads to binge eating behaviors (Sulkowski et al,, 2011) The current results indicate that SMW experience unique stressors related to their sexual orientation that activate binge eating through a similar pathway. These minority stressors activate social isolation and/or use of maladaptive emotion-coping strategies which in turn are associated with poorer mental health. Consistent with the affect regulation model, SMW then engage in binge eating behaviors perhaps to obtain relief from unwanted negative feelings. Although this model illuminates the pathways to binge eating, it is also possible to use these results to guide efforts to reduce binge eating and improve SMW health. If SMW increase their social

interactions, improve their coping strategies as they deal with minority stress, this should, in turn, improve mental health and reduce the need to engage in binge eating to cope with negative affect. Thus, positive psychological resources to assist SMW as they cope with minority stress are essential to improving health outcomes.

Previous research has been mixed on the severity of body shame in SMW; some studies reported that being a SMW was more of a protective factor regarding the development of body shame (Austin et al., 2004) while others reported that body shame was not different between SMW and heterosexual women (Haines et al., 2008; Share & Mintz, 2002). The current study found a normal distribution of body shame among SMW suggesting that SMW are not immune to feelings of body shame. A significant correlation was found between body shame and proximal minority stress that cannot be ignored. The path in the model between shame and proximal minority stress was not significant; it had a largely inflated standard error. This correlation suggests that feelings of shame in one aspect of a SMW's life may affect feelings of shame in another area; however, more studies looking at this association need to be done. Haines et al. (2008) proposed that lesbian with greater internalized homophobia may have greater concern to pass as a heterosexual women and adhere to the same physical appearance norms as heterosexual women.

Most notably, consistent with previous research, body shame was strongly related to binge eating in SMW (Haines et al., 2008; Lyders 1999). Shame did not mediate the relationship between proximal minority stress and binge eating as predicted. Therefore the study did not establish a relationship between minority stressors, shame, and binge eating. One reason for not finding significance for this path is statistical in nature; the

standard error for this path estimate was high. In future research, with a larger sample, and less variability, significant results may be found. All in all, the role of body shame in the current model needs more careful attention.

Although limited previous research has not yet been able to find a direct relationship between minority stress and eating-related behaviors (Swearingen, 2006), this study demonstrates the presence of this relationship through a network of mediated variables. When investigating binge eating in SMW, it is imperative to look at other important mediators and moderators in conjunction with sexual minority stress variables including BMI and gender identity.

Clinical and Community Implications

This study underscores the need for clinical providers to understand and assess the minority stress experiences of SMW. Clinicians need to understand SMW as women as well as sexual minorities who have unique experiences related to their sexual orientation. Providers must feel comfortable in discussing these experiences with SMW clients because of the strong impact of minority stress on the psychological health of SMW. Clinical providers also need to emphasize the importance of having a close social network and developing adaptive coping skills in SMW. These resources will help clients manage the minority stressors that they are experiencing and eventually to lessen them. By teaching SMW new social and coping skills, providers should be able to reduce the negative mental health outcomes that SMW experience which in turn will reduce their binge eating behaviors. They will have less negative affect and will not need to engage in binge eating to try to cope. Increasing health care providers' cultural competence vis-à-

vis sexual minorities is an essential step toward the goal of reducing health disparities and improving SMW's health.

Prevention efforts should be considered as well. Community outreach programs need to be developed to educate communities about sexual minority individuals and the impact of minority stressors on their health and mental state. This way the community may be less inclined to reject, discriminate, and judge sexual minority individuals based on their sexual orientation. Additionally, communities need to be informed of the importance of accepting SMW and being supportive of their sexual orientation. If communities and individuals are supportive of SMW, then SMW may experience less minority stress and have more resources to use to cope with minority stress that they do experience. All in all these prevention efforts will be effective in reducing negative mental and physical outcomes in sexual minority individuals. Globally, these efforts will be instrumental in closing the health disparity gap between sexual minorities and heterosexuals.

Limitations

The current study developed and tested a new model of pathways to binge eating behavior among SMW. Although the results make a contribution to the existing literature, limitations must be noted as well. First, the study was cross-sectional in design so no causal inferences can be made from the results. All data were gathered from all participants at one time point. The data were collected online due to the difficult nature of recruiting this population; therefore, it is necessary to trust that participants responded accurately and honestly and met the inclusionary criteria.

The participants were generally open about their sexual identity and displayed rather low IH. This is not surprising as individuals who are less out or who have more IH would not be as likely to complete a survey on sexual orientation. Also there was a limited amount of binge-eating behavior in this sample. It was a community sample and therefore not surprising that there was a low occurrence. Lastly the participants were relatively well-educated.

It was intended to examine how body mass index (BMI) fits in the model, and so information about height and weight, which would allow for a BMI score to be calculated, was collected. However, participants entered their heights in different metrics; therefore, the information was not useable.

Due to the lack of resources, the number of participants necessary for close fit with RMSEA based on the power analysis was not obtained. Consequently the final model had a higher RMSEA than recommended (Hu & Bentler, 1999). Although the model fit adequately, the model may have fit better, particularly with regards to RMSEA, if the number of participants prescribed by the power analysis was reached.

Future Directions

The most crucial direction for the continuation of this research is more complex methodology and measurement. The methodology enacted in this study was useful for exploring the relationships between these variables. Now that a base model has been developed, researchers need to employ new methods to gather data that is able to make causal inferences and can produce better treatments. For examples, future researchers should use repeated measure designs and longitudinal data collection to investigate binge eating in SMW.

Binge eating was measured by a simple self-report scale. More complex self-report scales could be used to measure binge-eating or even subjective and objective binge eating measures (see Timmerman, 1999). The IH and outness scales produced very skewed distributions so future researchers should use scales that are less skewed and more normative. Also, participants' age was limited to between 18 and 40 years. Future researchers should look at other ages of women and should also look at LGB men of all ages to see if this model fits well for them.

The Psychological Mediation Framework emphasizes the importance of not only mediators but moderators as well. Hatzenbuehler (2008) discussed the importance of moderators (e.g. sex, race, developmental influences, and identity characteristics) when looking at the impact of sexual minority stressors on health outcomes. Therefore future research needs to examine potential moderating variables in future models.

Summary and Conclusions

This study yields two important findings. First, it offers support for the Psychological Mediation Framework (Hatzenbuehler, 2009) regarding the relationship of sexual minority stress and health outcomes among SMW and the importance of examining potential mediators. Next, consistent with the Affect Regulation Model, minority stress was related to binge eating in SMW through a series of mediators that suggests that SMW may use binge eating to cope with negative affect. This study provides preliminary evidence that there are unique stressors that SMW experience that lead them to engage in binge-eating behaviors. These are stressors that heterosexual women do not experience. Numerous studies have demonstrated direct and indirect association between minority stress and SMW's health outcomes. Therefore researchers

must include these minority stress variables in models and studies to get a better representation of SMW health and the existence of health disparities. As researchers and clinicians strive to reduce health disparities between SMW and heterosexual women, it is essential to consider the role of sexual minority stress. These stressors are likely part of the explanation of the health disparities, including obesity, between SMW and heterosexual women.

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APPENDIX A

DEMOGRAPHIC INFORMATION

Please tell us a little about yourself:

1. Age:_____

2. Height (feet and inches):_____

3. Weight (lb):_____

4. Age at which you first disclosed your sexual orientation to anyone? _____

5. Age at which you first wondered about your sexual orientation? _____

6. Are you of Hispanic, Latin, or Spanish Origin?
   ____YES ____NO

7. Please indicate your racial group:

   ☐ White alone
   ☐ Black or African American alone
   ☐ American Indian and Alaska Native alone
   ☐ Asian alone
   ☐ Native Hawaiian and Other Pacific Islander alone
   ☐ Some Other Race alone
   ☐ Two or more races

8. Annual Income:_____

9. Check the category that best describes your occupation:
   ☐ Managerial/Professional
   ☐ Technical/Sales/Administrative
   ☐ Service
   ☐ Farming, Forestry, Fishing
   ☐ Mechanical, Construction, Production
   ☐ Machine Operation, Labor
   ☐ Student
   ☐ Homemaker
   ☐ Unemployed
   ☐ Retired

10. Years of Education: _____
    (12 = high school grad; 16= college grad):

11. The city/community/town in which I live is:

☐ Urban
☐ Suburban
☐ Rural

12. How do you define your sexual identity? Would you say that you are:
☐ only homosexual/lesbian
☐ mostly homosexual/lesbian
☐ bisexual
☐ mostly heterosexual,
☐ only heterosexual
☐ other (specify):_____.

13. **During the past year**, with whom have you had sex?
☐ women only
☐ women and men
☐ men only

14. With whom have you had sex **in your lifetime**?
☐ women only
☐ women and men
☐ men only

15. Relative to other gay/lesbian individuals, I
☐ am definitely in the closet.
☐ in the closet most of the time.
☐ half-in and half-out.
☐ out of the closet most of the time.
☐ completely out of the closet.

16. How open are you about your sexual preference/orientation? (Circle one)
☐ I work very hard to hide it.
☐ I don't want people to know.
☐ I selectively tell people I trust.
☐ I am not too worried about people knowing.
☐ I never hesitate to tell people.

17. Which of the following best describes who you are sexually attracted to?
☐ only women
☐ mostly women
☐ equally men and women
☐ mostly men
☐ only men

18. How often do you smoke cigarettes?
☐Often
☐Sometimes

☐Rarely
☐Never

19. How often do you drink alcohol?
    ☐ Often
    ☐ Sometimes
    ☐ Rarely
    ☐ Never
20. How often do you exercise?
    ☐ Often
    ☐ Sometimes
    ☐ Rarely
    ☐ Never
20. Have you engaged in binge eating in the past 6 months?
    ☐ Yes
    ☐ No
21. Have you engaged in any compensatory behaviors after binge-eating (e.g. purging, laxatives, excessive exercise?)
    ☐ Yes
    ☐ No

APPENDIX B

INTERNALIZED HOMOPHOBIA – REVISED (IHP-R)

1. I have tried to stop being attracted women in general.

1	2	3	4	5
Strongly Disagree				Strongly Agree

2. If someone offered me the chance to be completely heterosexual, I would accept the chance.

1	2	3	4	5
Strongly Disagree				Strongly Agree

3. I wish I weren't lesbian.

1	2	3	4	5
Strongly Disagree				Strongly Agree

4. I feel that being lesbian is a personal shortcoming for me.

1	2	3	4	5
Strongly Disagree				Strongly Agree

5. I would like to get professional help in order to change my sexual orientation from lesbian to straight.

1	2	3	4	5
Strongly Disagree				Strongly Agree

APPENDIX C

STIGMA CONSCIOUSNESS QUESTIONNAIRE

Use the 1 to 7 scale listed below to indicate how much you agree or disagree with each of the following statements. Please write your answer in the space provided beside each statement.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree

____ 1. Stereotypes about lesbians have not affected me personally.

____ 2. I never worry that my behaviors will be viewed as stereotypical of lesbians.

____ 3. When interacting with heterosexuals who know of my sexual preference, I feel like they interpret all my behaviors in terms of the fact that I am a lesbian.

____ 4. Most heterosexuals do not judge lesbian women on the basis of their sexual preference.

____ 5. My being lesbian does not influence how gay/lesbian individuals act with me.

____ 6. I almost never think about the fact that I am lesbian when I interact with heterosexuals.

____ 7. My being lesbian does not influence how people act with me.

____ 8. Most heterosexuals have a lot more homophobic thoughts than they actually express.

____ 9. I often think that heterosexuals are unfairly accused of being homophobic.

____10. Most heterosexuals have a problem viewing lesbian women as equals.

APPENDIX D

HHRDS (LGB INCLUSIVE VERSION)

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

Circle 1 –If the event has NEVER happened to you
Circle 2 –If the event happened ONCE IN A WHILE (less than 10% of the time)
Circle 3 – If the event happened SOMETIMES (10-25% of the time)
Circle 4 – If the event happened A LOT (26% -49% of the time)
Circle 5 – If the event happened MOST OF THE TIME (50-70% of the time)
Circle 6 – If the event happened ALMOST ALL OF THE TIME (more than 70% of the time)

1. In the past year, how many times have you been treated unfairly by teachers or professors *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

2. In the past year, how many times have you been treated unfairly by your employer, boss or supervisors *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

3. In the past year, how may times have you been treated unfairly by your co-workers, fellow students or colleagues *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

4. In the past year, how many times have you been treated unfairly by people in service jobs (by store clerks, waiters, bartenders, waitresses, bank tellers, mechanic and others) *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

5. In the past year, how many times have you been treated unfairly by strangers *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

6. In the past year, how many times have you been treated unfairly by people in helping jobs (by doctors, nurses, psychiatrists, caseworkers, dentists, school counselors, therapists, pediatricians, school principals, gynecologists, and others) *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

7. In the past year, how many times were you denied a raise, a promotion, tenure, a good assignment, a job, or other such thing at work that you deserved *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

8. In the past year, how many times have you been treated unfairly by your family *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

9. In the past year, how many times have you been called a *HETEROSEXIST* name like dyke, lezzie, faggot, sissy, or other names?

10. In the past year, how many times have you been made fun of, picked on, pushed, shoved, hit, or threatened with harm *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

11. In the past year, how many times have you been rejected by family members *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

12. In the past year, how many times have you been rejected by friends *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

13. In the past year, how many times have you heard *ANTI-LESBIAN/ANTI-GAY/ ANTI-BISEXUAL* remarks from family members?

14. In the past year, how many times have you been verbally insulted *because you are a LESBIAN/GAY/BISEXUAL PERSON?*

APPENDIX E

FRIENDSHIP SCALE

During the past month:
*1. It has been easy to relate to others:
□Almost always
□ Most of the time
□About half the time
□Occasionally
□Not at all

2. I felt isolated from other people:
□Almost always
□ Most of the time
□ About half the time
□Occasionally
□Not at all

*3. I had someone to share my feelings with:
□Almost always
□ Most of the time
□ About half the time
□Occasionally
□Not at all

*4. I found it easy to get in touch with others when I needed to:
□Almost always
□ Most of the time
□ About half the time
□Occasionally
□Not at all

5. When with other people, I felt separate from them:
□Almost always
□ Most of the time
□ About half the time
□Occasionally
□Not at all

6. I felt alone and friendless:
□Almost always
□ Most of the time
□ About half the time
□Occasionally
□Not at all

APPENDIX F

COGNITIVE EMOTION REGULATION QUESTIONNAIRE (CERQ)

How do you cope with events?

Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. By the following questions you are asked to indicate what you generally think, when you experience negative or unpleasant events.

	Almost Never	Some times	Regularly	Often	Almost Always
1. I think that I have to accept that this has happened	1	2	3	4	5
2. I often think about how I feel about what I have experienced	1	2	3	4	5
3. I think I can learn something from the situation	1	2	3	4	5
4. I feel that I am the one who is responsible for what has happened	1	2	3	4	5
5. I think that I have to accept the situation	1	2	3	4	5
6. I am preoccupied with what I think and feel about what I have experienced	1	2	3	4	5
7. I think of pleasant things that have nothing to do with it	1	2	3	4	5
8. I think that I can become a stronger person as a result of what has happened	1	2	3	4	5
9. I keep thinking about how terrible it is what I have experienced	1	2	3	4	5
10. I feel that others are responsible for what has happened	1	2	3	4	5
11. I think of something nice instead of what has happened	1	2	3	4	5
12. I think about how to change the situation	1	2	3	4	5
13. I think that it hasn't been too bad compared to other things	1	2	3	4	5
14. I think that basically the cause must lie within myself	1	2	3	4	5
15. I think about a plan of what I can do best	1	2	3	4	5
16. I tell myself that there are worse things in life	1	2	3	4	5
17. I continually think how horrible the situation has been	1	2	3	4	5
18. I feel that basically the cause lies with others	1	2	3	4	5

APPENDIX G

SOCIAL CONSTRAINTS QUESTIONNAIRE

Sometimes, even when others have good intentions, they may say or do things that are upsetting. Think about the PAST MONTH and indicate how often others did the following things:

Use the following scale:

1	2	3	4	5	6
None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time

Think about your **FAMILY** when you answer the next five questions:

___1. How often did you feel as though you had to keep your feelings about your sexual orientation/sexual identity to yourself because they made your family uncomfortable?

___2. How often did you feel that you could discuss your feelings about your sexual orientation/sexual identity with your family when you wanted to?

___3. When you talked about your sexual orientation/sexual identity, how often did your family give you the idea that they/he/she didn't want to hear about it?

___4. How often did you feel your family let you down by now showing you as much love and concern as you would have liked?

___5. How often has your family really got on your nerves?

Think about your **INTIMATE PARTNER** (if you are currently in a relationship with a woman or if you have been in a relationship with another woman) when you answer the next questions:

___1. How often did you feel as though you had to keep your feelings about your sexual orientation/sexual identity to yourself because your intimate partner made you uncomfortable?

___2. How often did you feel that you could discuss your feelings about your sexual orientation/sexual identity with your intimate partner when you wanted to?

___3. When you talked about your sexual orientation/sexual identity, how often did your intimate partner give you the idea that she didn't want to hear about it.

___4. How often did you feel your intimate partner let you down by now showing you as much love and concern as you would have liked?

___5. How often has your intimate partner really got on your nerves?

Think about **YOUR HETEROSEXUAL (STRAIGHT) FRIENDS** when you answer the next five questions:

___1. How often did you feel as though you had to keep your feelings your sexual orientation/sexual identity to yourself because your heterosexual friends made you uncomfortable?

___2. How often did you feel that you could discuss your feelings about your sexual orientation/sexual identity with your heterosexual friends when you wanted to?

___3. When you talked about your sexual orientation/sexual identity, how often did your heterosexual friends give you the idea that they didn't want to hear about it.

___4. How often did you feel your heterosexual friends let you down by now showing you as much love and concern as you would have liked?

___5. How often have your heterosexual friends really got on your nerves?

Think about **YOUR LESBIAN AND GAY FRIENDS** when you answer the next five questions:

___1. How often did you feel as though you had to keep your feelings about your sexual orientation/sexual identity to yourself because your lesbian and gay friends made you uncomfortable?

___2. How often did you feel that you could discuss your feelings about your sexual orientation/sexual identity with your lesbian and gay friends when you wanted to?

___3. When you talked about your sexual orientation/sexual identity, how often did your lesbian and gay friends give you the idea that they didn't want to hear about it.

___4. How often did you feel your lesbian and gay friends let you down by now showing you as much love and concern as you would have liked?

___5. How often have your lesbian and gay friends really got on your nerves?

APPENDIX H

MENTAL HEALTH INVENTORY (MHI)

The next set of questions are about how you feel, and how things have been for you during the past 4 weeks. If you are marking your own answers, please circle the appropriate response (0, 1, 2,...). If you need help in marking your responses, tell the interviewer the number of the best response. Please answer every question. If you are not sure which answer to select, please choose the one answer that comes closest to describing you. The interviewer can explain any words or phrases that you do not understand.

During the past 4 weeks,
how much of the time...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little bit of the time	None of the time
1. Has your daily life been full of things that were interesting to you?						
2. Did you feel depressed?						
3. Have you felt loved and wanted?						
4. Have you been a very nervous person?						
5. Have you been in firm control of your behavior, thoughts, emotions, feelings?						
6. Have you felt tense or high-strung?						
7. Have you felt calm and peaceful?						
8. Have you felt emotionally stable?						
9. Have you felt downhearted and blue?						
10. Were you able to relax without difficulty?						

11. Have you felt restless, fidgety, or impatient?						
12. Have you been moody, or brooded about things?						
13. Have you felt cheerful, light-hearted?						
14. Have you been in low or very low spirits?						
15. Were you a happy person?						
16. Did you feel you had nothing to look forward to?						
17. Have you felt so down in the dumps that nothing could cheer you up?						
18. Have you been anxious or worried?						

APPENDIX I

OBJECTIFIED BODY CONSCIOUSNESS (OBC)

INSTRUCTIONS:

Circle the number that corresponds to how much you agree with each of the statements on the following pages.

Circle NA only if the statement does not apply to you. Do not circle NA if you don't agree with a statement.

> For example, if the statement says "When I am happy, I feel like singing" and you don't feel like singing when you are happy, then you would circle one of the disagree choices. You would only circle NA if you were never happy.

	Strongly Disagree			Neither agree nor disagree			Strongly Agree
1. I rarely think about how I look.	1	2	3	4	5	6	7
2. When I can't control my weight, I feel like something must be wrong with me.	1	2	3	4	5	6	7
3. I think it is more important that my clothes are comfortable than whether they look good on me.	1	2	3	4	5	6	7
4. I think a person is pretty much stuck with the looks they are born with.	1	2	3	4	5	6	7
5. I feel ashamed of myself when I haven't made the effort to look my best.	1	2	3	4	5	6	7
6. A large part of being in shape is having that kind of body in the first place.	1	2	3	4	5	6	7
7. I think more about how my body feels than how my body looks.	1	2	3	4	5	6	7
8. I feel like I must be a bad person when I don't look as good as I could.	1	2	3	4	5	6	7

9. I rarely compare how I look with how other people look.....	1	2	3	4	5	6	7
10. I think a person can look pretty much how they want to if they are willing to work at it.....	1	2	3	4	5	6	7

APPENDIX J

BINGE EATING SCALE (BES)

Below are groups of statements about behavior, thoughts, and emotional states. Please indicate which statement in each group best describes how you feel.

(1)	○ I do not think about my weight or size when I'm around other people
	○ I worry about my appearance, but it does not make me unhappy
	○ I think about my appearance or weight and I feel dissapointed in myself
	○ I frequently think about my weight and feel great shame and disgust
(2)	○ I have no difficulty eating slowly
	○ I may eat quickly, but I never feel too full
	○ Sometimes after I eat fast I feel too full
	○ Usually I swallow my food almost without chewing, then feel as if I ate too much
(3)	○ I can control my impulses towards food
	○ I think I have less control over food than the average person
	○ I feel totally unable to control my impulses toward food
	○ I feel totally unable to control my relationship with food and I try desperately to fight my impulses toward food
(4)	○ I do not have a habit of eating when I am bored
	○ Sometimes I eat when I am bored, but I can often distract myself and not think about food
	○ I often eat when I am bored, but I can sometimes distract myself and not think about food
	○ I have a habit of eating when I am bored and nothing can stop me

(5)	○ Usually when I eat it is because I am hungry
	○ Sometimes I eat on impulse without really being hungry
	○ I often eat to satisfy hunger even when I know I've already eaten enough. On these occasions I can't even enjoy what I eat.
	○ Although I have not physically hungry, I feel the need to put something in my mouth and I feel satisfied or only when I can fill my mouth (for example with a piece of bread).
(6)	*After eating too much*:
	○ I do not feel guilty or regretful at all
	○ I sometimes feel guilty or regretful
	○ I almost always feel a strong sense of guilt or regret
(7)	○ When I'm on a diet, I never completely lose control of food, even in times when I eat too much
	○ When I eat a forbidden food on a diet, I think I've failed and eat even more
	○ When I'm on a diet and I eat to much, I think I've failed and eat even more
	○ I am always either binge eating or fasting
(8)	○ It is rare that I eat so much that I felt uncomfortably full
	○ About once a month I eat so much that I felt uncomfortably full
	○ There are regular periods during the month when I eat large amounts of food at meals or between meals
	○ I eat so much that usually, after eating, I feel pretty bad and I have nausea
(9)	○ The amount of calories that I consume is fairly constant over time
	○ Sometimes after I eat too much, I try to consume few calories to make up for the previous meal
	○ I have a habit of eating too much at night. Usually I'm not hungry in the morning and at night I eat too much

	○ I have periods of about a week in which I imposed *starvation diets,* following periods of when I ate too much. My life is made of binges and fasts
(10)	○ I can usually stop eating when I decide I've had enough
	○ Sometimes I feel an urge to eat that I cannot control
	○ I often feel impulses to eat so strong that I cannot win, but sometimes I can control myself
	○ I feel totally unable to control my impulses to eat
(11)	○ I have no problems stopping eating when I am full
	○ I can usually stop eating when I feel full, but sometimes I eat so much it feels unpleasant
	○ It is hard for me to stop eating once I start, I usually end up feeling too full
	○ It is a real problem for me to stop eating and sometimes I vomit because I feel so full.
(12)	○ I eat the same around friends and family as I do when I am alone.
	○ Sometimes I do not eat what I want around others because I am aware of my problems with food
	○ I often eat little around other people because I feel embarrassed
	○ I'm so ashamed of overeating, I only eat at times when no one sees me. I eat in secret.
(13)	○ I eat three meals a day and occasionally a snack
	○ I eat three meals a day and I usually snack as well
	○ I eat many meals, or skip meals regularly
	○ There are times when I seem to eat continuously without regular meals
(14)	○ I don't think about impulses to eat very much

	○ Sometimes my mind is occupied with thoughts of how to control the urge to eat
	○ I often spend much time thinking about what I ate or how not to eat
	○ My mind is busy most of the time with thoughts about eating. I seem to be constantly fighting not to eat
(15)	○ I don't think about food any more than most people
	○ I have strong desires for food, but only for short periods
	○ There are some days when I think of nothing but food
	○ Most of my days is filled with thoughts of food. I feel like I live to eat
(16)	○ I usually know if I am hungry or or not. I know what portion sizes are appropriate.
	○ Sometimes I do not know if I am physically hungry or not. In these moments, I can hardly understand how much food is appropriate.
	○ Even if I knew how many calories should I eat, I would not have a clear idea of what is, for me, a normal amount of food

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SELECTED PRESENTATIONS

Mason, T. B., Minifie, J. B.; Lewis, R. J., & Derlega, V. J. (2012, May). Social Constraints Mediate the Relationship between Stigma Consciousness and Psychological Distress in Sexual Minority Women. Poster presented at the 24rd Annual Convention of the Association of Psychological Science: Chicago.

Lewis, R. L., Milletich, R. J., Kelley, M. L., Mason, T. B., Derlega, V. J., & Minifie, J. B. (2012, May). Psychological Aggression in Lesbians' Relationships. Poster presented at the 24rd Annual Convention of the Association of Psychological Science: Chicago.

Dhillon, J. K., Hempler, E. L., Kowalczyk, D. M., McDaniel, K. B., Lewis, R. L., Mason, T.B., & Derlega, V. J. (2012, April). Correlates of Partner Violence among Lesbians. Poster presented at the Virginia Psychological Association Spring Convention: Norfolk.

Lund, S. K., Dhillon, J. K., Hollis, B. F., Lewis, R. L., Mason, T. B., & Derlega, V. J. (2012, April). Correlate of Psychological Aggression among Lesbians. Poster presented at the Virginia Psychological Association Spring Convention: Norfolk