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A HEAVY BURDEN: ASSOCIATIONS BETWEEN SEXUAL MINORITY STATUS,
MENTAL HEALTH, AND BMI IN WOMEN

A Master's Thesis Presented

by

ALISON E. A. GOLDBLATT

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

December 2019

Clinical Psychology Program

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MENTAL HEALTH, AND BMI IN WOMEN

A Thesis Presented

by

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ABSTRACT

A HEAVY BURDEN: ASSOCIATIONS BETWEEN SEXUAL MINORITY STATUS, MENTAL HEALTH, AND BMI IN WOMEN

December 2019

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Sexual minority women (SMW) are at increased risk of elevated body mass index (BMI) compared to heterosexual women, which increases their vulnerability to a variety of chronic diseases. This increased risk of elevated BMI is likely due to unique minority stressors faced by sexual minority individuals, such as internalized heterosexism and discrimination. Minority stressors are associated with poorer mental and physical health among SMW, and SMW may engage in unhealthy coping strategies, like binge eating, to cope with these minority stressors. Research suggests that bisexual women, and other women with non-monosexual orientations, face elevated risks to their physical and psychological health compared to women with monosexual orientations, possibly related to unique minority stressors (e.g., bi-negativity, anti-bisexual discrimination) and unique

responses to minority stressors. We recruited a sample of 437 primarily cisgender women, ages 18-65 years ($M = 26.38$; $SD = 8.11$), of all sexual orientations to complete a cross-sectional, online survey including self-report measures of sexual orientation, weight status, psychological distress, and eating behaviors. We investigated relations among these variables to better understand BMI disparities, both between SMW and heterosexual women and within SMW. Specifically, we examined how sexual orientation discordance (i.e., differences between dimensions of sexual orientation), psychological distress, eating behaviors, and BMI were related, and how different elements of sexual orientation influenced these associations. We found that the attraction and identity dimensions of sexual orientation were associated with symptoms of poorer mental and physical health among SMW. SMW reported more psychological distress, more binge eating, and elevated BMI than their heterosexual peers. Non-monosexual SMW reported the most psychological distress, binge eating, and highest BMIs, compared to all monosexual peers (i.e., heterosexual and lesbian). Clinicians should educate themselves, and their clients, about how risk factors may differ based on various aspects of sexual orientation (including sexual orientation discordance). They should provide culturally competent interventions at the first sign of either psychological distress, disordered eating, or elevated BMI. Future research should help to inform clinical practice by elucidating mechanisms by which mental and physical health symptoms contribute to each other, and how this may differ for distinct groups of women.

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CHAPTER 1

SPECIFIC AIMS

Aims and Hypotheses

Aim 1. To examine the associations between various sexual orientation dimensions (i.e., attraction, behavior, and identity) and a) unhealthy eating behaviors, b) psychological distress, and c) BMI in a sample of women of diverse sexual orientations.

Hypothesis. SMW will report more unhealthy eating behaviors, more psychological distress, and higher BMIs than heterosexual women across all dimensions of sexual orientation. SMW who are not exclusively lesbian in any individual dimension will report the most unhealthy eating behaviors, the most psychological distress, and the highest BMIs, compared to the other sexual orientation groups.

Aim 2. To explore the association between sexual orientation discordance (i.e., the extent to which different sexual orientation dimensions do not align) and unhealthy eating behaviors, psychological distress, and BMI, and whether each individual sexual orientation dimension moderates this association.

Hypothesis. Higher discordance across sexual orientation dimensions will be associated with more unhealthy eating behaviors, more psychological distress, and higher BMI (main effects). This will be accentuated in women closer to the monosexual (i.e., exclusively heterosexual, exclusively lesbian) ends of the spectrum in each individual sexual orientation dimension (interaction effect).

Aim 3. To test a hypothesized model predicting BMI, incorporating sexual orientation dimensions, sexual orientation discordance, psychological distress, and unhealthy eating behaviors as predictors (see Figure 1).

Hypothesis. Sexual orientation discordance will predict psychological distress, such that increased discordance is associated with increased psychological distress, and this association will be moderated by sexual orientation identity; sexual orientation discordance will have a stronger positive relation with psychological distress for women with monosexual identities or identities closer to these ends of the spectrum than for other women. Increased psychological distress will predict increased unhealthy eating behaviors, and these associations will also be moderated by sexual orientation identity; psychological symptoms will more strongly predict unhealthy eating behaviors for SMW than for exclusively heterosexual women, and will more strongly predict these behaviors for non-monosexual SMW than for exclusively lesbian women. Unhealthy eating behaviors will predict BMI, such that increased binge eating will be associated with increased BMI. Elevated BMI will also directly predict increased psychological distress (see Figure 1).

CHAPTER 2

BACKGROUND AND SIGNIFICANCE

Meyer's (2003) minority stress model proposed that unique stressors associated with being a sexual minority (person experiencing romantic and/or sexual attractions that fall outside of the heterosexual norms) contribute to poor health and contribute to identity-based health disparities for this population. Such stressors include both proximal (e.g., internalized heterosexism) and distal (e.g., discrimination) factors, which have been found to be associated with poorer health status, in terms of both physical and mental health (Bankoff, Marks, Swenson, & Pantalone, 2016; Katz-Wise et al., 2014; Lewis, Millettich, Mason, & Derlega, 2014). The majority of studies in this area have examined cisgender populations (as opposed to transgender or gender non-binary populations), so only research on cisgender samples is reviewed. Cisgender sexual minority women (SMW)—compared to their exclusively heterosexual peers—report increased rates of elevated body mass index (BMI), unhealthy eating behaviors, and psychological distress (Bankoff & Pantalone, 2014; IOM, 2011). These eating- and weight-related health disparities are often understood within Meyer's minority stress framework (e.g., Frost, Lehavot, & Meyer, 2015; Mereish, 2014). Relative to SMW with monosexual sexual orientation identities (e.g., lesbian), women with non-monosexual sexual orientations

(e.g., bisexual, mostly heterosexual) appear to be at additional risk for unhealthy eating behaviors and elevated BMI in some studies (Katz-Wise et al., 2014; Koh & Ross, 2006). It is important to better understand this disparity among SMW, specifically as it relates to risk factors for elevated BMI, in order to better serve this vulnerable and stigmatized population.

SMW and Body Mass Index

The majority of published research on the topic of SMW and BMI has found that sexual minority women are more likely to have a higher BMI than their heterosexual peers (Eliason et al., 2015). As SMW comprise only a small proportion of the U.S. population (IOM, 2011), it has often been necessary for investigators to collapse SMW subgroups (e.g., lesbian, bisexual) to obtain large enough sample sizes for use in inferential statistical analyses. For this reason, there are relatively few studies comparing BMI differences between bisexual and lesbian women, which present mixed findings (Eliason et al., 2015). Studies have measured a variety of weight-related outcomes (e.g., mean BMI, percent overweight or obese in each identity category), with some studies finding similar rates of obesity between lesbian and bisexual women, some finding higher rates among lesbian women, and some finding higher rates among bisexual women. Different studies have also defined lesbian and bisexual differently. For example, some studies combine lesbian and mostly lesbian identity groups into a single “lesbian” group, while others include the mostly lesbian identity group in a larger “bisexual” group. These differences make it difficult to draw definitive conclusions about differences in BMI among SMW.

However, there is some evidence that bisexual women may be at increased risk for elevated BMI compared to their lesbian peers. Published findings suggest that bisexual adolescents and women are at an increased risk of higher BMI compared to heterosexual adolescents and women (Katz-Wise et al., 2014). This same result was not found for lesbian adolescents and women in the sample. Interestingly, Katz-Wise and colleagues (2014) identified that the BMI discrepancy based on sexual orientation in their study was moderated by the women's race and ethnicity, such that the association was present for Latina and non-Latina White women, but not for non-Latina Black women, which may be related to high BMIs across the board for non-Latina Black women in the sample. Bisexual women also appear more likely to engage in weight cycling (i.e., gain weight that was previously lost on purpose) than exclusively heterosexual women (Polimeni, Austin, & Kavanagh, 2009). Again, this was not the case for the lesbian women in the sample.

In contrast, when examining BMI trajectories from adolescence to early adulthood (calculated using self-reported weight and height) in this same longitudinal dataset used by Katz-Wise and colleagues (2014), Wood and colleagues (2017) found that, in comparison to heterosexual women, both lesbian and bisexual women had a higher risk of developing obesity over the 14-year timespan examined. However, this association persisted only for lesbian women (but not for bisexual women) when controlling for other factors known to contribute to obesity, i.e., age, race/ethnicity, parental obesity, maternal education, household income, sexual abuse history, depressive symptoms, rural residence, and screen time. It is important to interpret these findings carefully, as some of these factors yield valuable information when not used as control

variables. For example, depressive symptoms may be key in understanding health disparities for bisexual women, as bisexual women report more depressive symptoms than lesbian and heterosexual women (Lehavot, 2012). If this is the case, controlling for depressive symptoms may be misleading, obscuring obesity disparities for bisexual women relative to their peers. Such information about the relation between obesity and its risk factors (e.g., depressive symptoms) for different subgroups of SMW would be helpful in addressing disparities that exist.

Finally, there is also evidence of an elevated risk of increased BMI for women identifying as mostly heterosexual. This group has been found to differ significantly from exclusively heterosexual women on several physical and psychological variables (Savin-Williams & Vrangalova, 2013; Vrangalova & Savin-Williams, 2014). Austin and colleagues (2009) found that adolescent girls and women identifying as mostly heterosexual had a significantly higher risk of being overweight than their exclusively heterosexual counterparts. Taken together with the findings for bisexual women, these findings for mostly heterosexual women lend support to the hypothesis that there is an increased risk of higher BMI for individuals with a variety of non-monosexual sexual orientations.

SMW and Unhealthy Eating Behaviors

The increased risk for psychological distress and poorer physical health among women with non-monosexual sexual orientations, compared to monosexual women, appears to extend to unhealthy eating behaviors as well. Understood within a minority stress theory framework, SMW may engage in unhealthy eating behaviors in response to,

or as a way to cope with, minority stressors. Polimeni and colleagues (2009) found that bisexual and mostly heterosexual women (participants chose category labels that they felt best represented them) were more likely than exclusively heterosexual women to report engagement in unhealthy weight control practices, including smoking and skipping meals. Mostly heterosexual women were also more likely to report purging behaviors, such as intentional vomiting and using laxatives, compared to exclusively heterosexual women (Polimeni et al., 2009), as were mostly heterosexual and bisexual adolescent girls (Austin, Ziyadeh, Corliss, Rosario, et al., 2009). This same result was not found for lesbian adolescents and women, which may be related to findings suggesting that lesbian women are more satisfied with their body weight and shape than other SMW (Polimeni et al., 2009).

Likely because of the frequently reported obesity among SMW, most published research of unhealthy eating behaviors among SMW has focused on the prevalence of binge eating behaviors, as opposed to restricting behaviors and other unhealthy eating behaviors. Here, too, SMW appear to be at elevated risk relative to their peers. Austin and colleagues (2009) found that, even as early as in adolescence, mostly heterosexual, bisexual, and lesbian women were all more likely to report binge eating than their exclusively heterosexual peers. Binge eating and other unhealthy eating behaviors are associated with differences in BMI. Increased binge eating, specifically, is a significant predictor of overweight and obesity, even after controlling for outness regarding sexual orientation and demographic variables (Mason, 2016).

Elevated BMI in and of itself, however, can also predict future unhealthy eating behaviors related to body shame, a personal experience of inadequacy and guilt elicited

by a negative evaluation of one's body (Mason & Lewis, 2015a; Tomiyama, 2014). Elevated BMI, and the stigma surrounding it, are significantly associated with increased body shame which is, in turn, significantly associated with increased negative affect and other psychological distress. Negative affect is significantly associated with greater binge eating in SMW. In this way, disparities in weight and unhealthy eating behaviors based on sexual orientation may compound each other. If SMW are at increased risk for both binge eating and elevated BMI compared to their heterosexual peers, binge eating may cause increases in BMI, and elevated BMI may lead to more binge eating (via body shame and negative affect). This compounded risk is especially problematic for women with non-monosexual sexual orientations, who seem to display significantly elevated risk compared to monosexual women for both elevated BMI and unhealthy eating behaviors (e.g., Katz-Wise et al., 2014; Polimeni et al., 2009).

SMW and Psychological Distress

Elevated BMI and unhealthy eating behaviors among SMW are often associated with depression, anxiety, and other mental health concerns (Johns, Zimmerman, Harper, & Bauermeister, 2017; Mason & Lewis, 2015b; Mason & Lewis, 2015c). Further, the presence of sexual minority-specific stressors may lead to additional psychological distress (Lewis et al., 2014; Meyer, 2003). Social constraints (i.e., difficulty talking to others about one's sexual orientation, often related to others' avoidance of, or disinterest in, the topic) and rumination about one's life situation represent one potential sequential mediation pathway from minority stressors to psychological distress (Lewis et al., 2014).

This association between sexual minority stressors and psychological distress puts SMW at additional risk for psychological distress relative to their heterosexual peers.

Pathways between stressors and psychological distress may also affect subgroups of SMW differently, potentially due to differences in coping strategies. Coping strategies may be adaptive (e.g., cognitive reframing, self-care activities) or maladaptive (e.g., behavioral disengagement, coping-motivated eating, and other unhealthy eating behaviors). Maladaptive coping strategies often contribute to mental health challenges and, if different groups tend towards different coping strategies, a group using more maladaptive coping strategies may have worse outcomes than a group using more adaptive strategies. For example, Lehavot (2012) found that bisexual women reported significantly greater depressive symptoms and poorer mental health than lesbian women. Within this sample, maladaptive coping fully mediated the relations between sexual orientation and current mental health in a sample of SMW. Bisexual women were more likely than lesbians to report maladaptive coping strategies, such as behavioral disengagement and self-blame, and the women's self-report of engagement with these strategies appeared to be related to their increased psychological distress relative to lesbians. Here, again, this set of findings appear to indicate that women with non-monosexual sexual orientations are at greater risk for psychological distress than their monosexual peers.

Psychological distress is, itself, closely tied to unhealthy eating behaviors in SMW. In a sample of 1,098 women and girls enrolled in the longitudinal Growing Up Today Study, Katz-Wise and colleagues (2015) found that depressive and anxious symptoms were associated with both coping-motivated eating and disinhibited eating

among SMW (all measured at the same time point). These associations existed for the mostly heterosexual, bisexual, and lesbian groups within the sample, although the patterns of associations varied between groups (Katz-Wise et al., 2015). For example, anxious symptoms were found to be positively associated with coping-motivated eating among mostly heterosexual and lesbian women, and with disinhibited eating among lesbian women. However, depressive symptoms were negatively associated with coping-motivated eating among mostly heterosexual women and with disinhibited eating among lesbian women. This latter finding is in contrast with other research in this area, which suggests depressive symptoms are positively associated with eating behaviors that contribute to weight gain; negative affect, specifically, has been found to be associated with binge eating in multiple published studies (Mason et al., 2017; Mason & Lewis, 2015b).

There is also evidence that psychological distress temporally precedes unhealthy eating behaviors. In a cross-sectional study of sexual minority men and women, Feldman and Meyer (2010) compared age of onset of eating disorders and comorbid psychiatric disorders in a sample of lesbian, gay, and bisexual men and women. Among SMW with comorbid major depressive disorder (MDD), SMW were more likely to have experienced MDD prior to, rather than at the same time as or after, the onset of the eating disorder (Feldman & Meyer, 2010). This suggests that disordered eating among SMW may be an example of maladaptive coping used to manage depressive symptoms. Although this study used a cross-sectional rather than a longitudinal design, these results are consistent with many previous cross-sectional findings in other populations. Because of this association between psychological distress and unhealthy eating behaviors, the high

prevalence of psychological distress that other studies have found among SMW—and especially among women with non-monosexual sexual orientations—is cause for concern (e.g., IOM, 2011; Lehavot, 2012).

Potential Explanations for Psychological Distress, Unhealthy Eating Behaviors, and Elevated BMI Associated with SMW's Non-Monosexual Orientations

The increased risk for elevated BMI, unhealthy eating behaviors, and psychological distress among women with non-monosexual orientations compared to both heterosexual and lesbian peers is striking (e.g., Austin, Ziyadeh, Corliss, Haines, et al., 2009; Lehavot, 2012; Polimeni et al., 2009). In attempting to better understand and prevent these disparities, researchers have worked to identify the minority stressors that may be operating uniquely within this population. Chief among this list of potential stressors are bi-negativity (holding derogatory attitudes toward bisexuality) and anti-bisexual discrimination (behaving in oppressive ways towards bisexual individuals because of bi-negativity; Brewster, Moradi, Deblaere, & Velez, 2013). Bisexual and other women with non-monosexual orientations experience hostility and suspicion from both their exclusively heterosexual peers as well as their exclusively lesbian peers (Mulick & Wright, 2014). This is sometimes referred to as “double discrimination” (Friedman et al., 2014). Repeated exposure to stigmatization may cause these women to internalize negative attitudes about bisexuality and conceal their sexual orientation, which is known to be a stressor (Pachankis, 2007). Bisexual and other non-monosexual women also experience increased sexual objectification relative to other women, because of the hypersexualized portrayal of bisexual women in the media, an additional stressor that is

specifically related to their bodies (Brewster et al., 2014). According to objectification theory, sexual objectification may promote unhealthy eating behaviors by increasing internalization of socioculturally based standards of attractiveness, body monitoring, shame, and anxiety, and decreasing awareness of internal bodily states (Brewster et al., 2014; Fredrickson, B. L., & Roberts, 1997).

Incongruence in one's lived experience between different dimensions of sexual orientation (e.g., identifying as lesbian but being attracted to both men and women), referred to as sexual orientation discordance, is an additional potential stressor which may impact non-monosexual SMW differently from other SMW. As our understanding of sexual orientation has become more nuanced, it has become clear that multiple dimensions of sexual orientation are salient and operating in all people (Badgett, 2009; Sell, 1997). Most often, published research focuses on sexual attraction, sexual behavior, and sexual identity as unique entities. Sexual attraction can be defined as arousal or the desire to have a sexual or loving relationship with a person (or people). Sexual behavior can be defined as voluntary physical contact with another person (or people) for the purpose of sexual gratification or arousal. Sexual identity can be defined as a personally selected, socially bound label to describe a person's perception of their sexuality (Savin-Williams, 2006). Because they are distinct, an individual's sexual attraction, sexual behavior, and sexual identity may operate independently of each other (Savin-Williams, 2006). Sexual orientation discordance (as opposed to concordance) has been found to be positively associated with depressive symptoms, hazardous drinking behaviors, suicidal ideation, and suicide attempts, and cognitive dissonance theory has been used to help explain distress associated with sexual orientation discordance (Annor et al., 2018;

Caplan, 2017; Lourie & Needham, 2017; Talley, Aranda, Hughes, Everett, & Johnson, 2015). Being partnered or sexually active in a way that does not correspond exactly to your attraction or identity may be associated with cognitive dissonance (Everett, 2015; Everett, Talley, Hughes, Wilsnack, & Johnson, 2016). For instance, a woman who identifies as lesbian and is currently partnered with a cisgender man (rather than with a cisgender woman) may experience internal distress associated with an incongruence between her self-ascribed sexual orientation identity and current sexual behavior. This level of dissonance may depend on when this dissonance is occurring (e.g., outside of an expected period of sexual identity development, such as adolescence) and the amount of time one has identified with a given label; it may be more challenging to experience discordance between dimensions the longer a given sexual orientation identity has been a consistent part of one's overall identity. Beyond this internally felt dissonance, social connections and support related to one's sexual orientation identity may become strained or lost in such an instance of incongruence (Everett et al., 2016). For example, if one's social group centers around a shared sexual orientation identity, and discordance is a unique experience that is not shared by the group, rejection or othering is a possible outcome for someone experiencing discordance. In general, these findings indicate that sexual orientation discordance may serve as another stressor, and that having a complex sexual identity in this way has the potential to negatively impact one's mental health.

Beyond internalized bi-negativity and identity concealment, it is possible that having a non-monosexual identity (versus a monosexual lesbian or heterosexual identity) creates unique internal stress related to sexual orientation discordance. While sexual

orientation discordance has been studied largely in terms of women who identify as exclusively heterosexual or exclusively lesbian, and less studied among self-identified non-monosexual women (e.g., Annor et al., 2018; Caplan, 2017), it is important to consider how sexual orientation discordance may also be a stressor for non-monosexual SMW, perhaps in ways distinct from their peers. In many ways, a non-monosexual identity may promote increased ability to think more flexibly about sexual orientation, and about identity in general, which could serve as a protective factor both specifically related to discordance and more generally (e.g., Brewster et al., 2013). However, non-monosexual SMW in monogamous relationships may more frequently face the unique burden of the identity erasure implicit in sexual orientation discordance, as their sexual behavior does not fully capture the scope of their identity and/or attraction. For this reason, sexual orientation discordance is important to explore among non-monosexual as well as monosexual women.

Given the increased risk for elevated BMI, unhealthy eating behaviors, and psychological distress among women with non-monosexual orientations compared to women with monosexual orientations, as well as our increasingly nuanced understanding of multidimensional views of sexual orientation, it is important to determine if sexual orientation discordance may also be associated with risk for psychological distress, unhealthy eating behaviors, and elevated BMI in this population. In this study, we aim to examine potential relations between sexual orientation discordance, psychological distress, unhealthy eating behaviors, and reported BMI using path analysis in a sample of adult women of all sexual orientations. Specifically, we predict that increased sexual orientation discordance will be directly associated with increased psychological distress,

and indirectly associated with increased unhealthy eating behaviors and elevated reported BMI.

CHAPTER 3

RESEARCH DESIGN AND METHODS

Participants

To recruit a sample of women with a full range of sexual orientations, we emailed a variety of types of organizations across all 50 U.S. states. Some organizations served sexual minority women specifically, but others were geared towards women without regard to sexual orientation (e.g., university gay-straight alliances vs. women's recreational sports teams). In total, 464 women provided informed consent and completed any measures. After excluding individuals who enrolled erroneously (i.e., did not meet the official inclusion criteria: being female, not identifying as transgender, age 18+) but filled out the survey nevertheless, and those who provided too little data to be meaningfully included in the present analyses, the final sample included 437 cisgender women, ages 18-65 years ($M = 26.38$; $SD = 8.11$).

Procedure

After obtaining Institutional Review Board (IRB) approval from Suffolk University, we invited women age 18 years and older to participate in an online survey

advertised to focus on “eating habits and attitudes.” In exchange for their participation, women could elect to enter a raffle for a \$50 gift card. Participants provided electronic informed consent, after which they completed the online survey. Participants were only able to complete the study once per IP address. To protect the privacy of participants, we used encryption and disabled IP logging provided by SurveyMonkey, a web-based data collection tool. After participants provided informed consent, they were presented with the online survey and, at the end of the session, were provided with national mental health resources—including resources specifically geared toward sexual minority individuals and individuals with eating concerns (who may or may not be sexual minorities).

Measures

Demographic questionnaire.

Participants completed standard demographic questions regarding age, height, weight, race/ethnicity, education level, country of origin, U.S. state of residence, personal income level, parental income level, and preferred language. Weight (lb) and height (in) were used to calculate BMI (lb/in²) using the following formula: weight (lb) / [height (in)]² x 703 (CDC, 2014).

Sexual orientation.

We assessed sexual orientation using three of 12 items from the Sell Assessment of Sexual Orientation (Sell, 1997). This measure, similar to that which was made famous by Kinsey (Kinsey, Pomeroy, & Martin, 1948), assesses separately three different components of sexual orientation: sexual attractions (e.g., arousal, dreams, fantasies),

sexual behaviors (i.e., sexual contact), and sexual identification (i.e., self-reported sexual orientation). Each component is assessed on a continuum with eight response choices—seven from “exclusively heterosexual” to “exclusively homosexual,” and one option for none. Sexual orientation identity ratings were used to classify participants as either monosexual (i.e., “exclusively heterosexual” or “exclusively homosexual”) or non-monosexual (i.e., all other response options, with the exception of the non-identification option). Women who reported that they did not identify with any sexual orientation were excluded from analyses. We chose to administer one question to assess each of the three components to minimize burden on participants (associated Kinsey scale numbers were not in the original survey but were added here for increased clarity):

1. The following question is asked to assess how frequently and intensely you are sexually attracted to men and women. Consider times you had sexual fantasies, daydreams, or dreams about a man or woman, or have been sexually aroused by a man or woman.
During the past year, my sexual interests have been:
 - a. I have had no sexual interests during the past year^[1]_{SEP}
 - b. Exclusively homosexual (women only; Kinsey-A-6)
 - c. Predominantly homosexual, only incidentally heterosexual^[1]_{SEP} (Kinsey-A-5)
 - d. Predominantly homosexual, but more than incidentally heterosexual (Kinsey-A-4)
 - e. Equally heterosexual and homosexual (men and women equally; Kinsey-A-3)
 - f. Predominantly heterosexual, but more than incidentally homosexual (Kinsey-A-2)
 - g. Predominantly heterosexual, only incidentally homosexual^[1]_{SEP} (Kinsey-A-1)
 - h. Exclusively heterosexual (men only; Kinsey-A-0)
2. The following question is asked to assess your sexual contacts. Consider times you had contact between your body and another man or woman's body for the purpose of sexual arousal or gratification.
During the past year, my sexual contacts have been:
 - a. I have had no sexual contacts during the past year^[1]_{SEP}
 - b. Exclusively homosexual (women only); Kinsey-B-6)
 - c. Predominantly homosexual, only incidentally heterosexual^[1]_{SEP} (Kinsey-B-5)
 - d. Predominantly homosexual, but more than incidentally heterosexual^[1]_{SEP} (Kinsey-B-4)
 - e. Equally heterosexual and homosexual (equal number of men and women;

- Kinsey-B-3)
- f. Predominantly heterosexual, but more than incidentally homosexual^[SEP] (Kinsey-B-2)
 - g. Predominantly heterosexual, only incidentally homosexual^[SEP] (Kinsey-B-1)
 - h. Exclusively heterosexual (men only; Kinsey-B-0)
3. The following question is asked to assess your sexual identity.
- I consider myself:
- a. I do not identify with any sexual orientation^[SEP]
 - b. Exclusively homosexual^[SEP] (Kinsey-I-6)
 - c. Predominantly homosexual, only incidentally heterosexual^[SEP] (Kinsey-I-5)
 - d. Predominantly homosexual, but more than incidentally heterosexual (Kinsey-I-4)
 - e. Equally heterosexual and homosexual^[SEP] (Kinsey-I-3)
 - f. Predominantly heterosexual, but more than incidentally homosexual (Kinsey-I-2)
 - g. Predominantly heterosexual, only incidentally homosexual^[SEP] (Kinsey-I-1)
 - h. Exclusively heterosexual (Kinsey-I-0)

Sexual orientation discordance.

We calculated sexual orientation discordance using participants' self-reported sexual attraction, sexual behavior, and sexual identity dimension ratings. To measure discordance across dimensions, we calculated difference scores between all pairings of sexual orientation dimensions, by subtracting participants' ratings of one sexual orientation dimension from their rating of another (i.e., attraction – behavior, identity – behavior, and attraction – identity). This practice is conceptually similar to a latent difference score method previously used with sexual orientation dimensions, that measured the mathematical difference between identity and behavior ratings, and attraction and behavior ratings (Talley et al., 2015).

Measures of eating behavior.

Eating attitudes and behavior. We used the Eating Attitudes Test (EAT-26) to assess attitudes, feelings, and behaviors related to eating (Garner, Olmsted, Bohr, &

Garfinkel, 1982). The EAT-26 is a reliable and valid instrument for measuring disordered eating symptoms ($\alpha = .90$; Garner et al., 1982; Túry, Güleç, & Kohls, 2010). Although not specifically validated for use with SMW, it has been used previously in studies examining sexual orientation disparities in disordered eating among men (e.g., Reilly & Rudd, 2006) and women (e.g., Guille & Chrisler, 1999; Share & Mintz, 2002). The EAT-26 contains 26 items which form three subscales: a 13-item dieting subscale, a 6-item bulimia and food preoccupation scale, and a 7-item oral control subscale. Participants are asked to indicate the frequency with which they endorse each item on a 6-point scale ranging from “*never*” to “*always*.” Subscale scores are calculated by summing the responses in each category and overall score is calculated by summing all responses. Higher scores represent more disordered eating symptoms, and scores above 20 indicate that clinical follow-up is recommended. Internal consistency for the overall measure was good in our sample ($\alpha = 0.89$). Internal consistency in our sample varied across the measure’s subscales. Internal consistency was poor for the oral control subscale ($\alpha = .58$), acceptable for the bulimia and food preoccupation subscale ($\alpha = .72$), and good for the dieting subscale ($\alpha = .88$).

Sample items:

1. Am terrified about being overweight. (Dieting Subscale)
3. Find myself preoccupied with food. (Bulimia and Food Preoccupation Subscale)
5. Cut my food into small pieces. (*Oral Control Subscale*)

Binge eating behavior. We used the Binge Eating Scale (BES) to assess binge eating behavior (Gormally, Black, Daston, & Rardin, 1982). This instrument has been used with a range of populations (e.g., Túry, Güleç, & Kohls, 2010) to assess subjective

self-report of eating behavior. The BES contains 16 items, in which participants select statements that best describe their perception of their eating behavior (range 0-46). Scores are calculated by summing all responses, with higher scores representing more binge eating. Scores up to 17 indicate mild or no binge eating, scores between 18 and 26 suggest moderate binge eating, and scores greater than 27 indicate severe binge eating. The scale developers compared total scores on each individual item to determine initial consistency, with all chi-square tests of significance being equal to or greater than 9.1 ($p < .01$; Gormally et al., 1982). It also appears to be a reasonable initial assessment for binge eating disorder, with 0.85 sensitivity and 0.20 specificity (Celio, Wilfley, Crow, Mitchell, & Walsh, 2004). The BES has not been used previously with SWM. However, the measure showed excellent internal consistency reliability for our sample ($\alpha = 0.91$).

Sample item (#7):

- ☐ I don't lose total control of my eating when dieting even after periods when I overeat.
- ☐ Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.
- ☐ Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens I eat even more.
- ☐ I have a regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or "famine."

Measures of psychological distress.

Psychological symptoms. We used the anxiety and depression symptom dimensions of the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) to

assess psychological symptoms that are sometimes associated with unhealthy eating behaviors. The BSI has been used previously with SMW (Mustanski, Garofalo, & Emerson, 2010). In the BSI, participants indicate, on a 5-point Likert scale (0 = *not at all*; 4 = *extremely*), how much they have been distressed or bothered by a series of problems in the past seven days (including the current day). The full assessment contains 53 items. We used only the anxiety and depression symptom dimensions, which each contain six items. Subscale scores are calculated by summing the responses in each category and overall score is calculated by summing all responses. Higher scores represent more anxiety and depression, respectively. These 12 items have demonstrated good internal consistency reliability, with Cronbach's coefficient alphas 0.81 and 0.85, respectively (Derogatis & Melisaratos, 1983). Reliability was also good in our sample for both the anxiety ($\alpha = 0.87$) and depression ($\alpha = 0.88$) symptom dimensions.

Sample items:

3. Nervousness or shakiness inside (Anxiety Subscale)

14. Feeling hopeless about the future (Depression Subscale)

Positive and negative affect. We used the Positive and Negative Affect Schedule (PANAS) to assess positive and negative affect, which has previously been associated with unhealthy eating behaviors in other studies. The PANAS has been used previously with SMW (Riggle, Rostosky, & Horne, 2009). In the PANAS, two 10-item mood scales assess positive and negative affect (Watson, Clark, & Tellegen, 1988). On these items, participants indicate on a 5-point Likert scale (1 = *very slightly or not at all*; 5 = *extremely*) the extent to which they experience various emotions. Subscale scores are calculated by summing the responses in each category and overall score is calculated by

summing all responses. Higher scores represent more positive, negative, and overall affect, respectively. To maintain consistency with the BES, which does not specify a timeframe, we instructed participants to indicate how they feel “generally.” Previous studies using a “general” timeframe have showed good internal consistency for both the positive ($\alpha = 0.88$) and negative ($\alpha = 0.87$) affect scales (e.g., Watson et al., 1988). Our sample demonstrated excellent internal consistency for the positive affect scale ($\alpha = 0.91$), and good internal consistency for the negative affect scale ($\alpha = 0.89$).

Sample items:

10. Proud (Positive Affect Subscale)

11. Irritable (Negative Affect Subscale)

Statistical Analyses

Statistical analyses were completed using IBM SPSS Statistics version 25.

Throughout the analyses, we included demographic covariates previously related to unhealthy eating behaviors, psychological distress, and BMI. Specifically, we controlled for age, race/ethnicity, and income in all analyses. Due to limitations in our sample characteristics, we dichotomized race/ethnicity as White participants and participants of color, and we dichotomized income using a median split ($Mdn = \$10,000$). To account for missing values and skewed distributions, we also prepared data for analysis using Expectation-Maximization (EM) imputation and logarithmic transformations when needed (Bartlett & Kendall, 1946; Dempster, Laird, & Rubin, 1977).

To test Aim 1, examining the associations between each of the sexual orientation dimensions and unhealthy eating behaviors, psychological distress, and BMI, we

performed one-way ANCOVAs to compare unhealthy eating behaviors, psychological distress, and BMIs across seven levels of sexual orientation (i.e., the seven Likert scale levels from Exclusively Heterosexual to Exclusively Lesbian). In each of these one-way ANCOVAs, we tested separately each of the three dimensions of sexual orientation (attraction, behavior, and identity) and ran post hoc tests when indicated to identify differences that emerged.

To test Aim 2, examining potential interactions between sexual orientation and sexual orientation discordance in relation to unhealthy eating behaviors, psychological distress, and BMI, we first calculated a sexual orientation discordance variable. To measure discordance across dimensions, we calculated difference scores between all pairings of sexual orientation dimensions, by subtracting participants' ratings of one sexual orientation dimension from their rating of another (i.e., attraction – behavior, identity – behavior, and attraction – identity). As noted previously, this practice is conceptually similar to a latent difference score method previously used with sexual orientation dimensions, that measured the mathematical difference between identity and behavior ratings, and attraction and behavior ratings (Talley et al., 2015). In that study, a latent variable was used in order to make longitudinal comparisons. We determined that a simplified difference score would be adequate for a cross-sectional study, because a structural equation model was otherwise unnecessary for our analyses, as all of our constructs were directly observable. We also determined that the numerical difference between these ratings would be a meaningful discordance operationalization for each participant, because participants reported information about different dimensions in sequence and on the same scale.

We performed regressions with sexual orientation discordance, sexual orientation, and their interaction as independent variables, and unhealthy eating behaviors, psychological distress, and BMI as the dependent variables. For the sexual orientation variable in each analysis, we used the dimension that displayed the strongest associations with unhealthy eating behaviors, psychological distress, and BMI from the Aim 1 analyses.

To test Aim 3, assessing a hypothesized model of BMI, we used path analysis to test a model based on theory and available data (Figure 1). The goal of this model was to examine relations among our variables of interest as they provide information relevant to predicting BMI. We performed multiple group analyses to determine if structural paths, particularly the paths between sexual orientation discordance and psychological distress, and the paths between psychological distress and unhealthy eating behaviors, vary across sexual orientation identity groups.

CHAPTER 4

RESULTS

A Note on Language

Our self-reported sexual orientation options correspond with the Kinsey scale number ratings, which are commonly understood in the field of sexuality studies. To maximize clarity, we will describe sexual orientation identity and attraction results using these number ratings. For example, women who *identified* as Exclusively Heterosexual will be described as Kinsey-I-0s, and women who *identified* as Exclusively Homosexual will be described as Kinsey-I-6s. For women who reported their *attraction* in the same ways, we will also describe them as Kinsey-A-0s and Kinsey-A-6s, respectively.

Although our sample comprised self-identified cisgender women only per the inclusion criteria, we avoid using the language of “same-” or “opposite-gender” attraction in our results and discussion, as these terms reify the socially constructed male-female gender binary. We will instead use the term “androssexual” to describe attraction to men/masculinity, and “gynesexual” to describe attraction to women/femininity. This language is more inclusive of individuals who identify their gender outside of this binary (Hall, 2019).

Aim 1

BMI. BMI was significantly associated with sexual orientation identity ($F(6,390) = 2.35, p < .05, \eta_p^2 = .03$). Women who identified as predominantly lesbian but more than incidentally heterosexual (Kinsey-I-4s; $p < .05$) and women who identified as predominantly lesbian and only incidentally heterosexual (Kinsey-I-5s; $p < .01$) had significantly higher BMIs than women who identified as exclusively lesbian (Kinsey-I-6s). Women who identified as predominantly lesbian and only incidentally heterosexual (Kinsey-I-5s) had a significantly higher BMI than women who identified as exclusively heterosexual (Kinsey-I-0s; $p < .01$) and women who identified as predominantly heterosexual, and only incidentally lesbian (Kinsey-I-1s; $p < .05$).

Psychological Distress. Negative affect was significantly associated with the attraction ($F(6,418) = 3.71, p < .01, \eta_p^2 = .05$) and identity ($F(6,393) = 2.78, p < .05, \eta_p^2 = .04$) dimensions of sexual orientation. Women with predominant androsexual attraction but more than incidental gyneseexual attraction (Kinsey-A-2s) reported higher levels of negative affect than women with exclusively androsexual attraction (Kinsey-A-0s; $p < .01$), women with predominant androsexual attraction and incidental gyneseexual attraction (Kinsey-A-1s; $p < .01$), women with equal gyneseexual and androsexual attraction (Kinsey-A-3s; $p < .05$), women with predominant gyneseexual attraction but more than incidental androsexual attraction (Kinsey-A-4s; $p < .01$), and women with exclusively gyneseexual attraction (Kinsey-A-6s; $p < .001$). Women with predominant gyneseexual attraction and incidental androsexual attraction (Kinsey-A-5s) reported higher levels of negative affect than women with exclusively androsexual attraction (Kinsey-A-0s; $p < .05$) and women with exclusively gyneseexual attraction (Kinsey-A-6s; $p < .05$).

Women who identified as predominantly heterosexual and only incidentally lesbian (Kinsey-I-1s) reported higher levels of negative affect than women who identified as exclusively heterosexual (Kinsey-I-0s; $p < .05$) and women who identified as exclusively lesbian (Kinsey-I-6s; $p < .05$). We observed these same associations for women who identified as predominantly heterosexual but more than incidentally lesbian (Kinsey-I-2s; $p < .05$). Women who identified as predominantly lesbian and only incidentally heterosexual (Kinsey-I-5s) reported higher levels of negative affect than women who identified as exclusively lesbian (Kinsey-I-6s; $p < .05$).

Depression scores were also significantly associated with sexual attraction ($F(6,413) = 2.63, p < .05, \eta_p^2 = .04$). Women with predominant androsexual attraction but more than incidental gynesexual attraction (Kinsey-A-2s) reported higher levels of depression than women with exclusively androsexual attraction (Kinsey-A-0s; $p < .001$), women with predominant androsexual attraction and incidental gynesexual attraction (Kinsey-A-1s; $p < .05$), women with equal gynesexual and androsexual attraction (Kinsey-A-3s; $p < .01$), and women with exclusively gynesexual attraction (Kinsey-A-6s; $p < .01$). Women with predominant gynesexual attraction but more than incidental androsexual attraction (Kinsey-A-4s) also reported higher levels of depression than women with exclusively androsexual attraction (Kinsey-A-0s; $p < .05$).

Unhealthy Eating Behaviors. Binge eating scores were significantly associated with sexual orientation identity ($F(6,393) = 2.38, p < .05, \eta_p^2 = .04$). Women who identified as Kinsey-I-1s reported more binge eating behaviors than women who identified as Kinsey-I-0s ($p < .05$) or Kinsey-I-6s ($p < .01$). Women who identified as

Kinsey-I-2s ($p < .01$), Kinsey-I-3s ($p < .05$), and Kinsey-I-5s ($p < .05$) all reported more binge eating behaviors than women who identified as Kinsey-I-6s.

Eating behaviors other than binge eating were not significantly associated with sexual orientation identity, attraction, or behavior in this sample.

Aim 2

Sexual orientation discordance between identity and behavior was significantly and positively associated with negative affect ($\beta = .116, p < .05$), such that increased discordance was associated with increased negative affect. In this regression, when the discordance variable was added, sexual orientation itself was no longer significantly associated with negative affect, and there did not appear to be an interaction between this discordance variable and sexual orientation. No other discordance variables showed significant associations with the dependent variables of interest.

Aim 3

We ran a path analysis to evaluate the fit of a model in which sexual orientation discordance and BMI predicted psychological distress, psychological distress predicted binge eating, and binge eating predicted BMI (Figure 2). In the full sample, sexual orientation discordance predicted negative affect ($\beta = .111, p < .05$) but not depression. This finding indicates that—holding BMI constant—for every 1 standardized unit increase in sexual orientation discordance, there is an expected .111 standardized unit increase in negative affect. Similarly, BMI predicted negative affect ($\beta = .147, p < .01$) but not depression, indicating that—holding sexual orientation discordance constant—for

every 1 standardized unit increase in BMI, there is an expected .147 standardized unit increase in negative affect.

In the next segment of the path, both negative affect ($\beta = .291, p < .001$) and depression ($\beta = .199, p < .001$) predicted binge eating. Thus, for every 1 standardized unit increase in negative affect and depression, respectively, there is an expected .291 and .199 standardized unit increase in binge eating, holding the other constant.

Finally, binge eating predicted BMI ($\beta = .349, p < .001$) such that, for every 1 standardized unit increase in binge eating score, there is an expected .349 standardized unit increase in BMI.

The path model fit differed based on self-ascribed sexual orientation identity. In examining the pattern of significant paths across different sexual orientation identities, we observed variability in predictors of psychological distress, binge eating, and elevated BMI. For example, sexual orientation discordance significantly predicted negative affect only for women who identified as equally heterosexual and lesbian (Kinsey-I-3s; $\beta = .353, p < .05$; see Figure 5). Negative affect was a significant predictor of binge eating for women who collectively identified as predominantly heterosexual but either incidentally or more than incidentally lesbian (Kinsey-I-1s and 2s; $\beta = .423, p < .01$; see Figure 4) and women who collectively identified as predominantly lesbian but either incidentally or more than incidentally heterosexual (Kinsey-I-4s and 5s; $\beta = .335, p < .05$; see Figure 6). Depression was only a significant predictor of binge eating for women who identified as exclusively heterosexual (Kinsey-I-0s; $\beta = .319, p < .05$; see Figure 3).

Binge eating significantly predicted increased BMI for all groups of women, with the exception of those who identified as equally heterosexual and lesbian (Kinsey-I-3s;

see Figures 3-7). This association was the strongest for women who collectively identified as predominantly heterosexual but either incidentally or more than incidentally lesbian (Kinsey-I-1s and 2s; $\beta = .430, p < .001$; see Figure 4) and women who collectively identified as predominantly lesbian but either incidentally or more than incidentally heterosexual (Kinsey-I-4s and 5s; $\beta = .449, p < .001$; see Figure 6). BMI significantly predicted negative affect only for Kinsey-I-1s and 2s ($\beta = .292, p < .01$; see Figure 4).

CHAPTER 5

DISCUSSION

Overall, the results of this study suggest that SMW are at increased risk for negative mental and physical health symptoms compared to their heterosexual peers. Our results also suggest that non-monosexual SMW—that is, SMW whose sexual orientation identity, attraction, and/or behavior are not exclusively lesbian—are at additionally increased risk for negative mental and physical health status relative to their monosexual peers, both heterosexual and lesbian. These results are consistent with both the existing literature and with our *a priori* hypotheses. These findings replicate previous research findings about physical and mental health disparities for SMW broadly. For non-monosexual SMW specifically, this study adds granularity to the existing literature by examining disparities for seven subgroups of SMW as categorized by three different dimensions of sexual orientation. To our knowledge, this is the first published study to examine concurrent relations between psychological distress, binge eating, and elevated BMI for SMW, and the first to examine these in the context of different dimensions of sexual orientation. Finally, to our knowledge, this is the first study to examine associations between sexual orientation discordance and BMI.

The identity and attraction dimensions of sexual orientation were most strongly associated with our variables of interest, with SMW (whether categorized by identity or attraction) showing increased negative affect, depression, binge eating, and BMI relative to their heterosexual peers. Sexual orientation behavior was not found to be associated with these variables, perhaps because behavior is not as closely related to experiences of internalized stigma, or because a wider variety of women may demonstrate similar behavior patterns. Missing behavior data in the sample may have also contributed to this null result. Within SMW, non-monosexually identified and attracted women in our sample reported higher levels of negative affect, depression, and binge eating, as well as higher BMIs, than both their heterosexual and lesbian peers. Consistent with our hypotheses, we found that sexual orientation discordance was associated with increased psychological distress. Because this effect is small, and many of our measures are relatively gross, it is unsurprising that associations with sexual orientation discordance would not be significant in many analyses.

Compared to sexual orientation and the dimensions that comprise it, sexual orientation discordance is a relatively new construct in the literature. As such, there is no gold-standard for its operationalization, and it may be that there are better ways to calculate sexual orientation discordance that may have yielded more robust results. For example, an operationalization that incorporates, and quantifies differences among all three dimensions of sexual orientation concurrently might provide more complete and useful information. For the moment, even though this is one finding among many analyses, it highlights sexual orientation discordance as a potentially important construct

for further study because of its significant associations with increased psychological distress for some SMW.

Within our sample overall, results largely supported our hypothesized path model. In this model, it is striking that sexual orientation discordance specifically predicted negative affect but not depression, especially given that both constructs were highly correlated in the overall sample ($r = .637, p < .001$). This may be because, as measured by PANAS negative subscale, negative affect represents a broader set of emotional experiences (e.g., guilt, shame, fear, and nervousness) than does depression, as measured by the BSI depression subscale. Sexual orientation discordance may be more closely associated with shame, etc., than with sadness, worthlessness, or hopelessness. It is especially interesting that sexual orientation discordance predicted negative affect, and not depression, as negative affect has been more frequently linked to binge eating in the literature than has depression. If sexual orientation discordance is closely associated with negative affect, and negative affect is closely associated with binge eating, this may help to explain why non-monosexual SMW (who may experience more discordance than their monosexual peers) reported the highest levels of both negative affect and binge eating. The strong positive association between BMI and negative affect, but not depression, would also make sense in this context, because of the stronger association between negative affect (relative to depression) and binge eating, and the strong positive association between binge eating and BMI. More research is needed to understand better what might be driving these differential associations.

In examining potential sexual orientation subgroup differences in model fit, we identified that our model fit best for the combined subsample of Kinsey-I-1s and 2s, the

women who collectively identified as predominantly heterosexual but either incidentally or more than incidentally identified as lesbian. This combined subsample was the only one for whom BMI was directly associated with psychological distress. This finding is surprising because, based on the literature, we hypothesized that elevated BMI would be associated with more psychological distress more broadly for all women. It may be that, although all women exist in a society that values thinness, Kinsey-I-1s and 2s in this sample placed more emphasis on the importance of body image. This could be because of differences in their social circles' explicit values relative to the other subgroups (e.g., Bankoff et al., 2016), or because this group uses weight control more than other groups to manage distress or compensate for other perceived failings (which could include non-monosexuality due to binegativity if, for example, monosexual individuals comprise most of one's social circle), although this has not yet been clearly demonstrated in the literature. Notably, Kinsey-I-1s and 2s did not report the highest BMIs in the sample, so this association is not driven by elevated BMI for this group. However, they did report the most negative affect. Future research should aim to better understand how and why elevated BMI may be differentially associated with body image for different groups of women.

The path model also fit relatively well for the subsample of women who collectively identified as predominantly lesbian but either incidentally or more than incidentally heterosexual (Kinsey-I-4s and 5s), who showed similar associations between symptoms as the women who collectively identified as predominantly heterosexual but either incidentally or more than incidentally identified as lesbian (Kinsey-I-1s and 2s), and for women who identified as exclusively heterosexual (Kinsey-I-0s). Results showed,

for each of these groups of women, that there were significant positive paths between psychological distress and binge eating, and between binge eating and BMI. However, for Kinsey-I-1s and 2s and Kinsey-I-4s and 5s, there was a significant path between negative affect and binge eating, and for Kinsey-I-0s there was a significant path between depression and binge eating. It is striking that depression predicted binge eating for heterosexual women but not for any SMW. We did not predict this result, and Kinsey-I-0s did not report either the most depression or the most binge eating, so the results were not driven by higher overall reported symptoms. It may be that heterosexual women have different motives or triggers (i.e., sadness) for binge eating than SMW, or that binge eating brings up sadness and hopelessness, etc., more than it does other emotions for these women (Bayer, Robert-McComb, Clopton, & Reich, 2017; Brechan & Kvale, 2015; Mason & Lewis, 2014). Future research should determine if these results are replicable and, if they are, should further explore mechanisms of between-group differences in processes relating to disordered eating.

Our model fit least well for the women who identified as equally heterosexual and lesbian (Kinsey-I-3s) and the women who identified as exclusively lesbian (Kinsey-I-6s). Only one path was significant for the Kinsey-I-3s, the path between sexual orientation discordance and psychological distress. This was also the only group for whom the path was significant. We hypothesized that sexual orientation discordance would differentially predict psychological distress based on sexual orientation identity. However, in contrast to these results, we predicted that such discordance would be associated with *more* distress for women on the monosexual ends of the spectrum.

This finding that the path between discordance and psychological distress was only significant for women who identified as equally heterosexual and lesbian (Kinsey-I-3s) seems to indicate that, at least in our sample, sexual orientation discordance was associated with poor mental health for women who identify close to the middle of the spectrum—among the women who we predicted would have more cognitive flexibility about differences between dimensions of sexual orientation and for whom this ability may be protective. It is possible that, for women who do not lean towards a monosexual end of the spectrum, they more frequently have to confront differences between sexual orientation dimensions related to identity erasure. It may also be that women whose identities fall directly in the middle of the Kinsey scale are understood less well by others and, thus, they experience significantly more binegativity than other women in the “bisexual” category, which would counter any protective factors of cognitive flexibility. This invalidation of their identities might also lead them to have less social support which could, in turn, increase general psychological distress. It is also possible that these results were skewed by missing data, as fewer Kinsey-I-3s reported their sexual orientation behavior than did women with other sexual orientation identities. More research is needed to replicate and better understand this finding.

A positive association between binge eating and BMI was found for all groups other than the group of women who identified as equally heterosexual and lesbian (Kinsey-I-3s). More research is needed to replicate this finding and to understand why Kinsey-I-3s did not display the same pattern between binge eating and elevated BMI, as there is no literature that suggested this would be the case. It may be that this group engages in more compensatory behaviors (e.g., self-induced vomiting, excessive

exercising) after binges, such that binge eating is not as frequently associated with elevated BMI. However, there is no clear reason why this would be the case and so, more likely, this result is skewed by the overall smaller Kinsey-I-3 group size relative to the other subgroups. In contrast, the path between binge eating and BMI was the only significant path for the group of women who identified as exclusively lesbian (Kinsey-I-6s). The lack of an association between psychological distress and binge eating suggests that binge eating may serve a different function for Kinsey-I-6s than for other women. Lower psychological distress reported by Kinsey-I-6s may also be driving this lack of an association between psychological distress and binge eating.

Overall, within these results, the patterns of disparity among non-monosexual SMW are not straightforward to interpret. This complexity is unsurprising, given the significant heterogeneity of identities encompassed by this category. At the same time, it underscores the importance of characterizing non-monosexual SMW in our research samples in as fine-grained a manner as possible, to avoid the inadvertent implication of this group as a monolithic entity. This differentiation between subgroups appears especially important given how differently our hypothesized model functioned among different subgroups of SMW, including among subgroups of non-monosexual SMW. Our results can be understood to indicate that women across the full spectrum of the various sexual orientation dimensions may have different drivers of mental and physical health symptoms. Such differences are consistent with the complex trends reported in other recent research studies (e.g., Everett, Steele, Matthews, & Hughes, 2019; Katz-Wise et al., 2014; Shangani, Gamarel, Ogunbajo, Cai, & Operario, 2019). Because there are so many demographic differences between samples in these studies, as well as differences in

how sexual orientation is defined, it is important to understand what variability may be influencing between-group differences for non-monosexual SMW.

Future Research Directions

Given the associations found in this study between psychological distress, binge eating, and elevated BMI, it will be important to better understand mechanisms by which they may contribute to each other, and how these mechanisms may differ between groups. For example, does binge eating serve a different purpose (e.g., soothing, distracting, etc.) for different groups of women? Does binge eating trigger different emotional responses among different groups of women? Do different groups of women engage in compensatory behaviors to different degrees? Do these different emotional antecedents and consequences have implications for metabolic efficiency? A longitudinal approach will likely also be helpful in enhancing our understanding of how these risk factors are interrelated. Using information about mechanisms as a foundation, it will be important for researchers to develop and test interventions aimed at decreasing the incidence of these mental and physical health concerns among various subgroups of women.

The complexity of our results also supports the need for additional research that examines mental and physical health status more specifically for subgroups of non-monosexual SMW. Although it is difficult to recruit a large and diverse enough sample of SMW to do this meaningfully, more fine-grained analyses that investigate between-group comparisons are essential to more fully understand mental and physical health risks among SMW. It is also important that, in addition to diversity in sexual orientation

dimensions, research focus on samples diverse in terms of race, ethnicity, socioeconomic status, and other demographic characteristics. We understand that there are different risks associated with different intersections of marginalized identities (Everett et al., 2019; Shangani et al., 2019). Rather than simply describing homogenous samples as a limitation, it is important for investigators to focus proactively on recruiting more diverse samples.

An important first step in recruiting a more diverse sample is to set this as a goal at the outset while designing the study and devising recruitment methods. It will likely be difficult, if not impossible to achieve diversity among participants if it is an afterthought. Among other considerations, researchers should avoid convenience sampling, should reach out to community organizations that serve people of color, and should collaborate with respected community leaders. During study design, researchers should consider the relevance of their measures to people of varying backgrounds, as well as how the study will be of direct benefit to diverse groups. Expected benefits should be made explicit, as should a concrete plan to follow through on them. In terms of diversity with respect to socioeconomic status (which should not be conflated with race and ethnicity), researchers should make study participation accessible by helping with transportation logistics, providing options for participation outside of work hours, and providing options for childcare. Focusing on ongoing multicultural competence training and diversity among study staff will also contribute to more positive experiences for participants who hold a range of identities (Knight, Roosa, & Umaña-Taylor, 2009).

It will also be important to develop best practices for studying sexual orientation discordance. This is a construct that continues to be helpful in research studying sexual

minority individuals, and so it will be useful to understand the most informative way to operationalize this (which may be different across diverse groups). Some studies have categorized discordance in various ways that are straightforward to interpret but that result in bi-erasure to various extents (e.g., Annor et al., 2018; Caplan, 2017; Lourie & Needham, 2017; Pathela, Hajat, Schillinger, Blank, Sell, & Mostashari, 2006). Other studies have used continuous variables to quantify sexual orientation discordance (Fu et al., 2018; Talley et al., 2015), which add a greater level of detail to our understanding and increase statistical options for examining associations between sexual orientation discordance and mental and physical health risks. However, these methods raise questions about what it really means for two individuals to have the same “amount” of discordance. Does the impact of discordance differ based on which dimensions differ, where an individual falls on the Kinsey scale, or other contextual factors (e.g., demographics, social support, and cognitive flexibility, etc.)? Future research should aim to determine the most helpful operationalization, perhaps by testing different ways of quantifying discordance within the same sample. With this information in hand, we will be able to better compare results across research studies, which may help to catalyze progress this research area.

Implications for Clinical Practice

As this is a single study with findings that require replication, we want to avoid generalizations about clinical implications. At the same time, these findings indicate important areas of clinical need for women of all sexual orientations. Clinicians should be alert to psychological distress and binge eating as potential risk factors for elevated BMI,

and elevated BMI as a potential risk factor for increased psychological distress (Mason, 2016; Mason & Lewis, 2015b; Mason & Lewis, 2015c). As such, clinicians should be asking about each of these mental and physical health symptoms when any one of the others is apparent (Ciao, Loth, & Neumark-Sztainer, 2014). They should also be attempting to uncover, for each client, the specific mechanisms by which one symptom may be triggering another. It will be important for clinicians to closely follow published literature to familiarize themselves with how differences in sexual orientation and other demographics may be uniquely predicting symptoms (e.g., Mason & Lewis, 2015b).

As distinct dimensions of sexual orientation differently predict mental and physical health symptoms, and because there are significant differences in symptomology between subgroups of women that are often lumped together, it is important for clinicians to have a more nuanced understanding of their clients' sexual orientations (Pachankis & Goldfried, 2013). Different subgroups of SMW have vastly different experiences and, it appears, risk factors for psychological distress, binge eating, and increased BMI, and so it is important to use fine-grained measures of sexual orientation across dimensions in clinical settings. Using inclusive, culturally competent language on forms and during intake sessions, as well as asking open-ended demographic questions, may help clinicians begin to gather more helpful information about SMW (Hinrichs & Donaldson, 2017). Using measures that differentiate between subgroups in research and practice will be especially important as we continue to develop a clearer understanding of consistent risk patterns among subgroups of SMW. Given our differing patterns of results for identity, attraction, and behavior dimensions of sexual orientation, it is especially important for clinicians to understand differences between these dimensions and to have a multifaceted

understanding of how their clients' describe their sexual orientations in each dimension. Signaling a positive view of SMW with affirming language and visual cues in waiting areas (e.g., rainbow flags, resources and magazines geared towards LGBTQ+ individuals), and explicitly acknowledging the impact of minority stressors for SMW, may help create space for SMW to openly and comfortably discuss identity-related issues that are important to treatment (Hinrichs & Donaldson, 2017).

It is essential to understand sexual orientation dimensions more deeply than simply knowing how a client would label themselves. Clinicians need to consider what these labels mean to their clients in terms of lived experience (e.g., Israel, Gorcheva, Burnes, & Walther, 2008; Quiñones, Woodward, & Pantalone, 2017). Depending on the meaning clients ascribe to each label, there are different implications for social support and personal experiences of heterosexism and bi-negativity. For example, if a client reports bisexual attraction and uses this label to mean that they are mostly attracted to women but sometimes attracted to men, the client may have received very different messages about the validity and value of their identity than someone who reports bisexual attraction and who is equally attracted to men, women, and non-binary individuals. Asking about social networks, social supports, and families of choice during intake could be a helpful way to initiate conversations about contextual stressors for SMW (Hinrichs & Donaldson, 2017). Taking into account the nuanced meanings behind each label, clinicians should also be alert to discordance between identity, attraction, and behavior for each of their clients. This information will be helpful in understanding potential additional contextual stressors related to sexual orientation discordance.

Overall, clinicians should understand the increased mental and physical health risks for non-monosexual SMW and incorporate this knowledge into psychoeducation and prevention work for psychological distress, binge eating, and elevated BMI (Mason & Lewis, 2015b). For example, clinicians should explain to clients how psychological distress, binge eating, and elevated BMI are interrelated, and should explain unique risks to different groups of SMW. By being alert to increased symptom risk, using psychoeducation to alert clients to this risk, and teaching adaptive coping skills to manage stressors, clinicians may be able to help prevent escalation of symptoms by intervening in a culturally competent way when the first symptoms arise (Ciao et al., 2014; Mason & Lewis, 2015b). As the research studies continue to clarify our understanding of mental and physical health risks for non-monosexual SMW, clinicians should follow clinical recommendations in the literature in order to provide the best care possible for SMW (e.g., APA, 2012; Martell, Safren, & Prince, 2004; Pachankis & Goldfried, 2013).

Limitations

First and foremost, the results presented here are from a single research study. In order to make claims with any certainty, these results first need to be replicated. As with all research, our ability to draw conclusions about our results is limited by our methods. Most notably, our recruitment methods yielded a sample that was largely homogenous with regard to race and ethnicity. This lack of racial and ethnic diversity led us to dichotomize race in analyses, which limits our ability to understand how sexual orientation, mental health, and BMI are related among SMW of color. We know that race significantly influences how SMW move through the world, the cultural messages they

receive, and the types of discrimination they experience, and we also know that such experiences have important implications for differences in BMI (Everett et al., 2019; Katz-Wise et al., 2014; Shangani et al., 2019). It is insufficient and marginalizing to combine all people of color into a single group for the purposes of analysis, and it also significantly limits our ability to provide helpful information to the SMW who likely experience the most marginalization.

Our sample was also internet-based, so we were unable to do in-person reliability checks on any of our data. This limitation compounds the already challenging nature of using self-report measures, as individuals may interpret questions differently, have differing levels of insight about their internal experiences, and be influenced by social desirability biases. Social desirability biases are especially concerning related to self-reported weight, as this is a variable of particular interest to us. Although we collected information about participants' weight histories (i.e., highest, lowest, and current weight) as well as their perceived ideal weight, which may have given individuals more freedom to report accurate information, the stigmatized and loaded nature of weight status may lead participants to give performative answers (Richmond, Walls, & Austin, 2012).

More broadly, we are concerned about using BMI as a measure of weight status. There is general agreement that solely using height and weight to understand a person's weight status ignores several important factors. Chief among these are body composition; the goal of BMI is to quantify body fat, but BMI does not take build or muscle mass into account, which limits its usefulness as an indicator of health risk (Banack, Wactawski-Wende, Hovey, & Stokes, 2017; Gutin, 2018; Nickerson et al., 2018). Physical appearance, including which areas of the body contain a higher fat to muscle ratio, and

experiences of weight stigma may also be better indicators of risk for psychological distress related to weight and body image (Hosking, Lyons, & van der Rest, 2017; Jung, Spahlholz, Hilbert, Riedel-Heller, & Luck-Sikorski, 2017; Vadiveloo & Mattei, 2017). In-person measures of weight provide more options for studying weight status more thoughtfully.

Similarly, it is possible that there is a better way to operationalize sexual orientation discordance than the method we used. We would have liked to have been able to utilize all three sexual orientation dimensions in calculating discordance, as this would be a richer and more complete measure and could have yielded different results. In the future, having a standardized, agreed upon way to operationalize sexual orientation discordance will be helpful in resolving this limitation.

As we analyzed our data, we also realized there were additional pieces of information we wished we had. Most notably, we did not ask participants to list the sexual orientation labels they use in daily life to describe themselves. Having these labels would have allowed us to better understand subgroup composition and to further contextualize participants' responses throughout the study. Also, related to better understanding different dimensions of sexual orientation, it would have been helpful to have information about participants' relationship statuses, as well as the gender identity of their partners. It is possible that being in healthy relationships may mitigate some of the mental and physical health risks we are studying (Whitton, Dyar, Newcomb, & Mustanski, 2018). Information about relationship status would also provide useful context for understanding how participants categorized their sexual orientation, and potentially could have helped us better understand why participants did not respond to

some questions. For instance, only 85.6% of participants gave information about their sexual behavior, in comparison to 98.2% and 92.4% who provided information about their attraction and identity, respectively. This sample size difference limited our options in analyses, especially because we were attempting to compare seven subgroups within each.

Generally, studying sexual orientation continues to be challenging. At this point, we do not yet have enough information to know which sexual orientation label distinctions are most meaningful in disordered eating and weight disparity research. It is also important to consider potential confounds in how women self-identify in research contexts even before researchers define sexual orientation subgroups. Depending on the specificity of the sexual orientation demographic options that are provided to them, women may be obliged to self-identify as a member of the group that is closest to their identity but that does not exactly match their experience. For instance, in studies that do not include a bisexual or other non-binary demographic option, there exists a possibility that bisexual women will self-identify as either heterosexual or lesbian, depending on where they fall within the bisexuality spectrum. In studies that do include a bisexual demographic option, participants' responses may be influenced by their comfort in the research setting and by how affirming they experience the researchers to be, etc. Participants may also interpret even very nuanced measures differently, some responding with emotional attraction in mind and others answering with physical attraction in mind. What we mean and are trying to measure when we examine sexual orientation continues to increase in complexity, and this must be taken into account when interpreting results. It

will be important for us and others to address these limitations in future research so that we can be most helpful to the groups we are studying.

TABLES

Table 1. Race/ethnicity and income by sexual orientation dimensions.

		Race/Ethnicity						Income					
		White women		Women of color		Rather not say		<\$10,000		≥\$10,000		Rather not say	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Identity	All Respondants (N = 437)	350	80.1	81	18.5	6	1.4	213	48.7	200	45.8	24	5.5
	Kinsey-I-0	50	51	42	42.9	6	6.1	82	83.7	16	16.3	0	0
	Kinsey-I-1	43	75.4	13	22.8	1	1.8	30	52.6	21	36.8	6	10.5
	Kinsey-I-2	39	79.6	10	20.4	0	0	22	44.9	26	53.1	1	2
	Kinsey-I-3	32	82.1	7	17.9	0	0	19	48.7	17	43.6	3	7.7
	Kinsey-I-4	22	81.5	5	18.5	0	0	20	74.1	6	22.2	1	3.7
	Kinsey-I-5	51	81	10	15.9	2	3.2	26	41.3	34	54	3	4.8
	Kinsey-I-6	58	81.7	11	15.5	2	2.8	27	38	43	60.6	1	1.4
Attraction	Kinsey-A-0	78	84.8	14	15.2	0	0	42	45.7	43	46.7	7	7.6
	Kinsey-A-1	47	69.1	20	29.4	1	1.5	36	52.9	27	39.7	5	7.4
	Kinsey-A-2	45	81.8	10	18.2	0	0	31	56.4	22	40	2	3.6
	Kinsey-A-3	31	86.1	5	13.9	0	0	18	50	16	44.4	2	5.6
	Kinsey-A-4	32	80	7	17.5	1	2.5	29	72.5	9	22.5	2	5
	Kinsey-A-5	43	81.1	10	18.9	0	0	27	50.9	24	45.3	2	3.8
	Kinsey-A-6	68	80	13	15.3	4	4.7	27	31.8	55	64.7	3	3.5
Behavior	Kinsey-B-0	130	76.9	39	23.1	0	0	80	47.3	80	47.3	9	5.3
	Kinsey-B-1	22	84.6	3	11.5	1	3.8	17	65.4	9	34.6	0	0
	Kinsey-B-2	16	80	3	15	1	5	11	55	8	40	1	5
	Kinsey-B-3	6	75	2	25	0	0	5	62.5	2	25	1	12.5
	Kinsey-B-4	9	69.2	4	30.8	0	0	9	69.2	4	30.8	0	0
	Kinsey-B-5	18	90	2	10	0	0	12	60	8	40	0	0
	Kinsey-B-6	96	81.4	19	16.1	3	2.5	44	37.3	71	60.2	3	2.5

Table 2. Age, BMI, sexual orientation discordance, and binge eating by sexual orientation dimensions.

		Age			BMI			Sexual Orientation Discordance			Binge Eating (BES)		
		<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Identity	All Respondants (N = 437)	26.38	8.11	436	25.09	5.83	434	0.25	1.36	348	10.86	8.18	437
	Kinsey-I-0	25.76	7.38	98	24.03	4.49	98	-0.10	0.68	82	9.64	7.12	98
	Kinsey-I-1	25.38	6.26	56	24.41	5.67	56	0.52	1.05	50	12.61	8.85	57
	Kinsey-I-2	25.95	6.67	49	25.81	7.62	49	1.07	1.50	46	13.43	10.27	49
	Kinsey-I-3	26.79	8.48	39	26.69	7.46	38	1.00	2.24	32	11.44	7.85	39
	Kinsey-I-4	22.90	3.99	27	26.28	7.71	27	0.13	2.36	23	9.81	7.20	27
	Kinsey-I-5	26.08	6.00	63	26.26	6.01	62	-0.35	1.25	54	11.70	9.37	63
	Kinsey-I-6	30.26	12.06	71	24.20	4.39	71	0.07	0.31	61	8.20	6.71	71
Attraction	Kinsey-A-0	26.31	7.99	92	24.60	5.17	92	0.08	0.91	77	10.08	7.57	92
	Kinsey-A-1	25.26	5.53	67	23.54	3.57	67	0.76	0.82	59	11.62	8.47	68
	Kinsey-A-2	24.20	5.22	55	26.17	8.25	55	0.78	1.74	45	13.18	8.86	55
	Kinsey-A-3	27.69	9.14	36	26.51	6.69	35	0.78	2.03	27	11.69	8.55	36
	Kinsey-A-4	22.53	3.24	40	24.78	6.65	40	0.21	2.11	28	9.85	6.34	40
	Kinsey-A-5	24.87	5.19	53	25.71	4.55	52	-0.21	1.34	42	11.43	8.62	53
	Kinsey-A-6	30.94	11.62	85	25.15	5.69	85	-0.26	0.78	69	9.49	8.39	85
Behavior	Kinsey-B-0	26.58	7.08	168	24.31	5.26	169	0.93	1.15	159	11.15	8.14	169
	Kinsey-B-1	23.85	3.86	26	27.12	10.38	25	0.80	1.08	25	10.96	7.54	26
	Kinsey-B-2	24.75	6.90	20	24.89	5.91	20	0.42	1.12	19	16.60	9.52	20
	Kinsey-B-3	26.46	6.28	8	29.48	7.06	8	0.40	1.52	5	12.00	12.51	8
	Kinsey-B-4	23.79	5.90	13	23.09	3.62	13	0.45	0.93	11	9.08	4.35	13
	Kinsey-B-5	23.57	4.49	20	23.78	3.38	20	-0.59	1.12	17	8.80	5.34	20
	Kinsey-B-6	28.17	9.18	118	24.97	5.17	117	-0.77	1.11	112	9.58	8.14	118

Table 3. Negative affect, depression, and disordered eating by sexual orientation dimensions.

		Negative Affect (PANAS Negative)			Depression (BSI Depression)			Disordered Eating (EAT-26)		
		<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
All Respondants (N = 437)		20.98	7.49	437	6.53	5.27	432	9.00	9.75	437
Identity	Kinsey-I-0	19.43	6.96	98	5.14	4.59	98	9.38	10.46	98
	Kinsey-I-1	22.75	7.75	57	7.45	5.25	56	9.58	11.05	57
	Kinsey-I-2	22.63	8.44	49	7.19	5.15	47	10.78	11.80	49
	Kinsey-I-3	22.05	7.48	39	6.87	5.84	39	9.31	10.18	39
	Kinsey-I-4	22.11	8.43	27	7.00	4.65	27	9.00	9.31	27
	Kinsey-I-5	21.83	7.97	63	7.06	6.18	63	8.08	8.86	63
	Kinsey-I-6	18.39	6.02	71	5.59	5.11	71	6.61	6.49	71
Attraction	Kinsey-A-0	19.98	7.44	92	5.37	4.96	92	10.32	10.98	92
	Kinsey-A-1	20.74	6.78	68	6.12	4.39	65	8.12	9.88	68
	Kinsey-A-2	25.04	8.65	55	8.78	5.45	54	10.73	11.12	55
	Kinsey-A-3	21.08	7.30	36	6.19	5.61	36	9.89	10.98	36
	Kinsey-A-4	20.38	6.27	40	7.31	4.78	39	9.05	9.64	40
	Kinsey-A-5	22.57	8.10	53	7.70	6.14	53	8.81	9.13	53
	Kinsey-A-6	18.93	6.58	85	5.67	5.23	85	7.00	6.65	85
Behavior	Kinsey-B-0	20.84	7.47	169	5.66	4.65	166	9.40	10.57	169
	Kinsey-B-1	23.42	8.82	26	8.40	5.79	25	9.62	11.89	26
	Kinsey-B-2	26.20	8.84	20	9.42	6.55	19	14.75	13.41	20
	Kinsey-B-3	20.50	11.43	8	6.38	5.85	8	12.13	12.59	8
	Kinsey-B-4	22.77	6.31	13	8.46	6.06	13	9.54	9.72	13
	Kinsey-B-5	20.55	6.29	20	6.60	5.39	20	8.30	6.61	20
	Kinsey-B-6	19.31	6.74	118	5.53	4.85	118	7.36	8.14	118

FIGURES

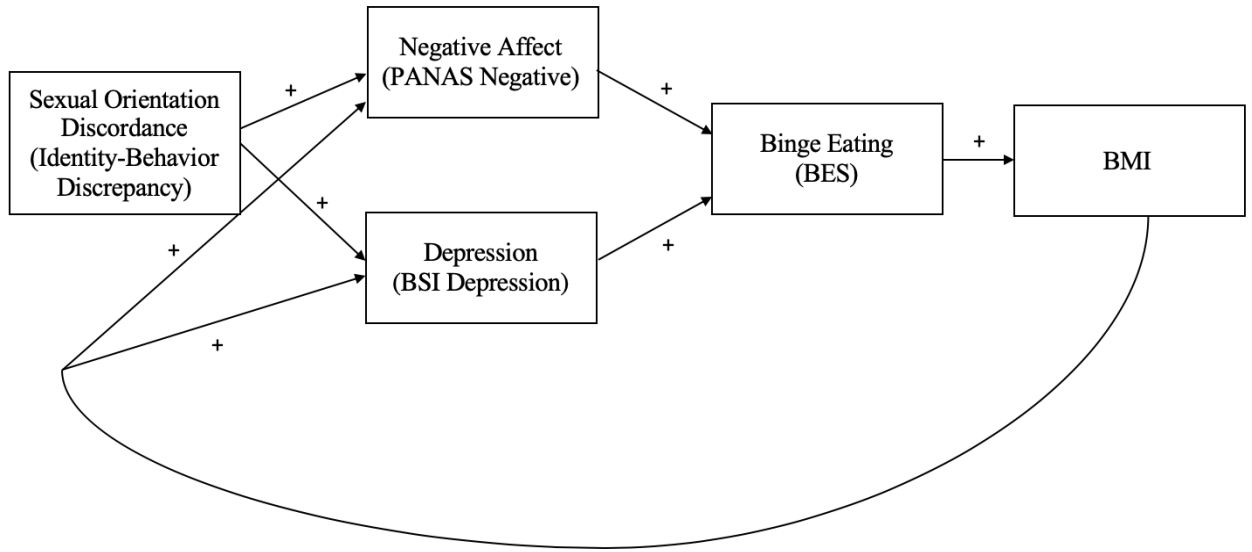


Figure 1. Hypothesized model predicting BMI.

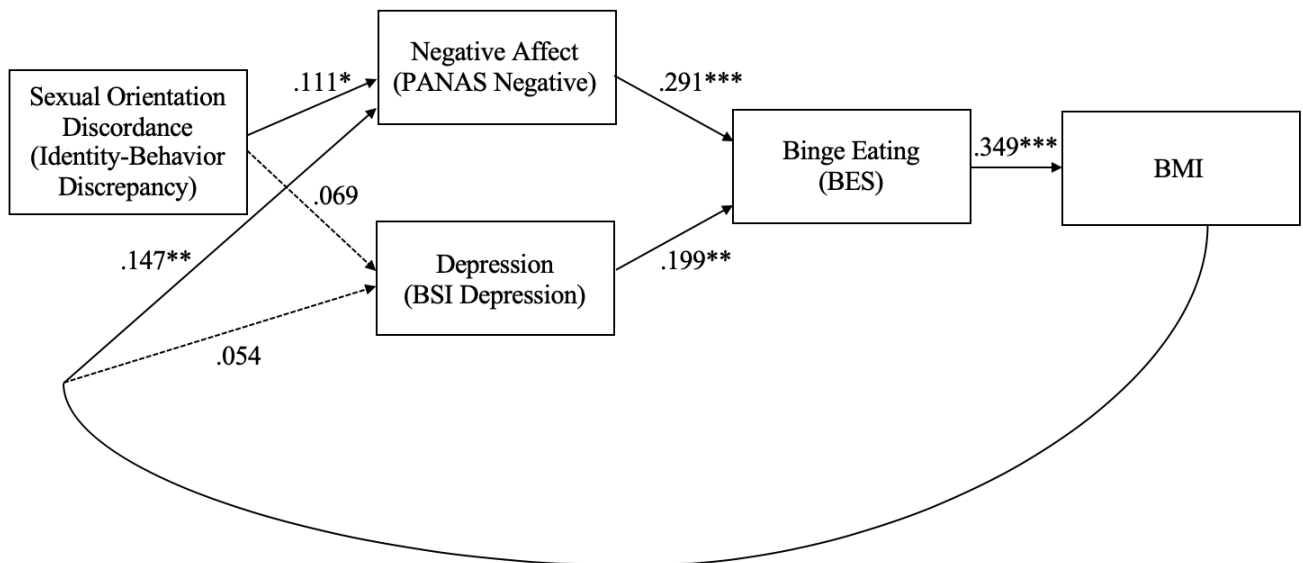


Figure 2. Model predicting BMI from sexual orientation discordance and mental health symptoms. All statistically significant paths are moderated by sexual orientation identity.

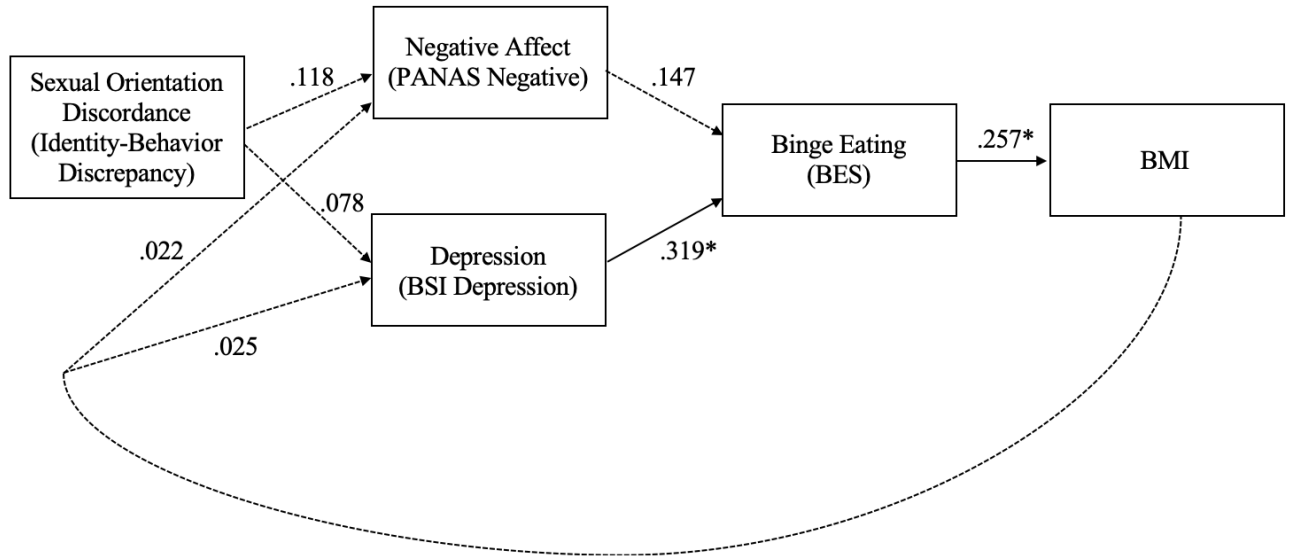


Figure 3. Model predicting BMI among women who identify as exclusively heterosexual (Kinsey-I-0).

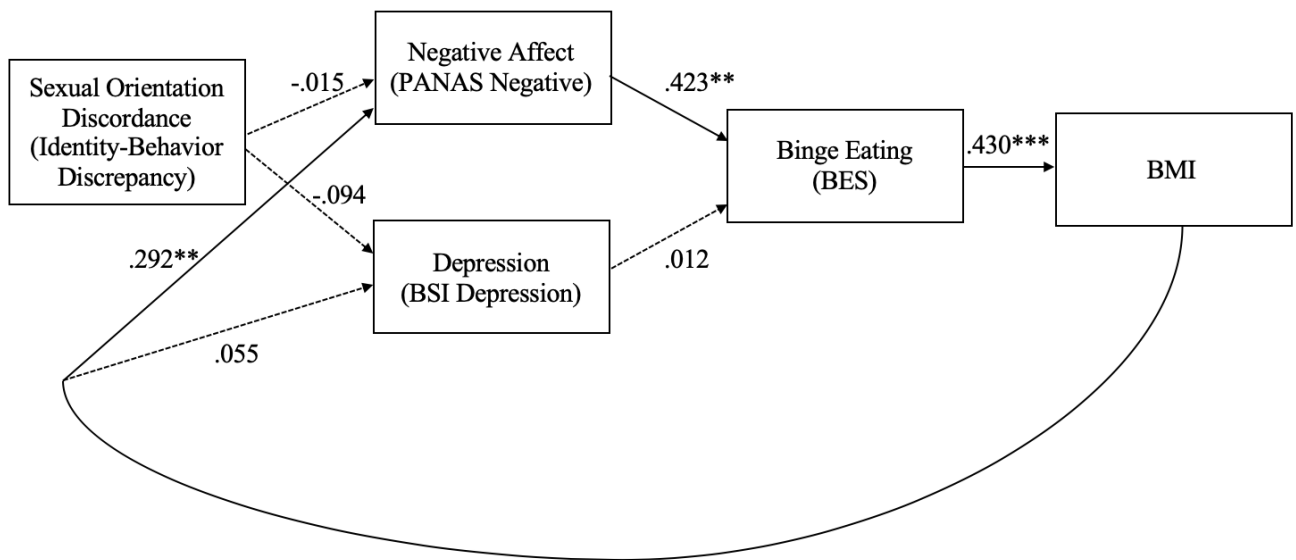


Figure 4. Model predicting BMI among women who identify as predominantly heterosexual but either incidentally or more than incidentally lesbian (Kinsey-I-1 and 2).

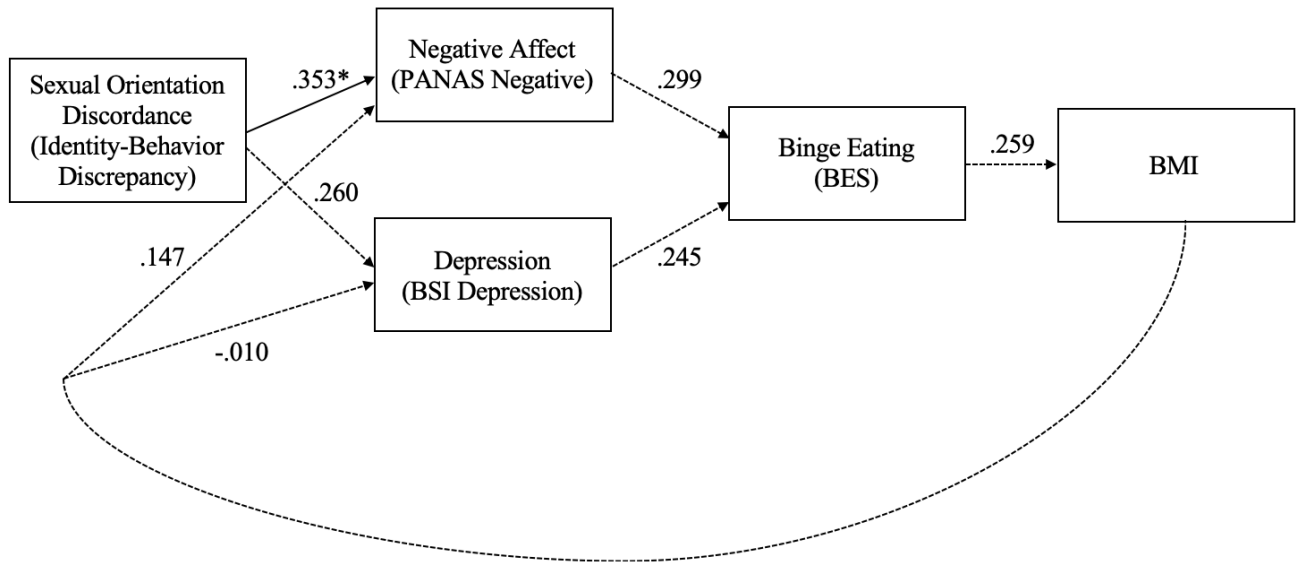


Figure 5. Model predicting BMI among women who identify as equally heterosexual and lesbian (Kinsey-I-3).

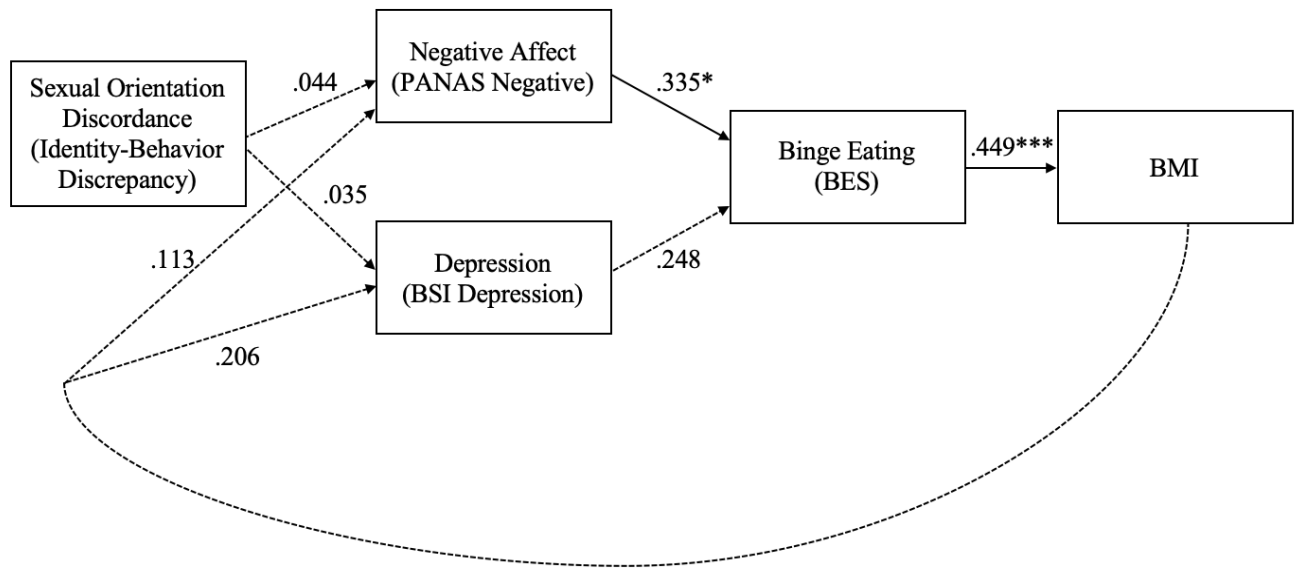


Figure 6. Model predicting BMI among women who identify as predominantly lesbian but either incidentally or more than incidentally heterosexual (Kinsey-I-4 and 5).

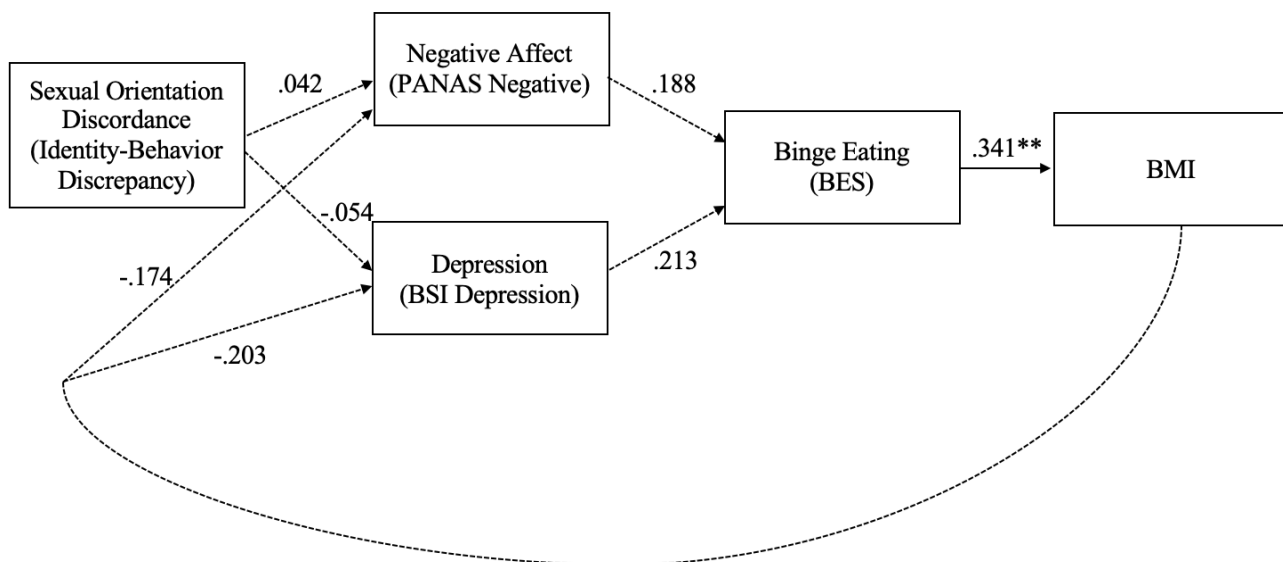


Figure 7. Model predicting BMI among women who identify as exclusively lesbian (Kinsey-I-6).

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