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Masculinity and Men's Health Attitudes Toward Consideration of Weight-Loss Surgery

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MASCULINITY AND MEN'S HEALTH ATTITUDES TOWARD CONSIDERATION OF WEIGHT-LOSS SURGERY

by

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ABSTRACT

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The rise in obesity across the United States has led to greater educational outreach, considerable research, and medical interventions aimed at decreasing the rate of obesity-related health diseases. But are these interventions reaching everyone? Despite men and women having equivalent rates of obesity, only 20% of weight-loss surgery patients are men. While men have an average life expectancy that is 5 years less than women and are twice as likely than women to have heart disease, men also underutilize healthcare services. Given these factors, this research explored men's health beliefs, conformity to male norms, and receptivity to weight-loss surgery.

This study examined whether a masculine self-identity moderated men's health beliefs in predicting receptivity to weight-loss surgery. A sample of men who self-reported a BMI of ≥35 were surveyed. This study used a modified health belief model to examine the predictive capability of *Perceived Severity*, *Perceived Susceptibility*, *Benefits, Barriers*, *Self-Efficacy*, *Health Value & Importance, Consideration of Future Consequences*, and *Appearance* and our outcome variable of *Consideration of WLS*. Furthermore, this study examined whether five of the aforementioned variables were moderated by *Masculine Self-Identity*.

The results showed that masculinity significantly changed the relationship between health beliefs as measured by *Barriers, Perceived Susceptibility, Health Value & Importance,* and

Perceived Severity and *Consideration of WLS*. Furthermore, the endorsement of a *Masculine Self-Identity* had the greatest interaction effects with predictors *Health Value & Importance* and *Perceived Susceptibility* and our outcome *Consideration of WLS.* These findings, which support literature that health-behaviors are influenced by masculinity, suggest masculinity plays a role in *Consideration of WLS.*

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INTRODUCTION

Obesity has become increasingly prevalent in the United States and has long been acknowledged as a health risk (Jensen et al., 2013). According to the National Institute of Diabetes and Digestive Kidney Diseases (NIDDK), more than 30% of men in the United States are overweight and 40% meet criteria for obesity (Fryar, Carroll, & Ogden, 2016). Studies have also predicted, based on current trends, that by the year 2030, nearly half of the world's population will be overweight or meet criteria for clinical obesity (Tremmel, Gerdtham, Nilsson, & Saha, 2017). Class II obesity, defined as a body mass index (BMI) of ≥35 and ≤39.9, and Class III obesity, ≥40, are particularly associated with several health risks (Jensen et al., 2013; Mehta & Chang, 2011). The Centers for Disease Control and Prevention (CDC) reported that obesity substantially increases the likelihood for an individual to develop type II diabetes, sleep apnea, cancer, stroke, hypertension and heart disease, and gallbladder disease, among other illnesses (CDC, 2019).

Heart disease is the number one cause of death in the United States, is significantly associated with obesity, and affects men twice the rate of women (CDC, 2017). Men are also more likely to die of cancer than women, with 470 of every 100,000 men dying from cancer (CDC, 2016). The high rates of heart disease, along with the high rates of developing cancer, have resulted in men having an average life expectancy that is 5 years less than women (CDC, 2017). Additionally, rates of diabetes, another leading cause of death, is similar across sexes (Heron, 2017). More than 13% of the United States population have diabetes with 90-95% of that subpopulation having Type II diabetes, which is primarily preventable and associated with obesity (Sarwer, Ritter, Wadden, Spitzer, Vetter, & Moore, 2013). Given these findings, there have been significant efforts to treat wide-spread obesity, including medically supervised dietary

changes, pharmaceutical interventions, and prescribed physical activity (CDC, 2011; Jensen et al., 2014). For example, the CDC (2008) released *Steps to Wellness*, a set of guidelines for increasing the amount of physical activity in the workplace, focusing on increased walking. Additionally, the U.S. Department of Health and Human Services recently released a new set of general physical activity guidelines, targeted at increasing physical activity in Americans (DHHS, 2018). However, treatment guidelines report that medically supervised dietary and physical activity interventions, even when combined with pharmaceutical therapies, result in only 5%-10% of bodyweight-loss over a six-month period (Jensen et al., 2013). Thus, these interventions are largely ineffective.

Due to the limitations of diet and exercise for reducing obesity, some physicians and patients have turned to weight-loss surgery (WLS), commonly called bariatric surgery, as a successful intervention (Ahern, Aveyard, Boyland, Halford, & Jebb, 2016; Garvey et al., 2016). While there are multiple approaches to WLS surgery, all procedures include a surgical intervention that reduces the amount of food that can be eaten by way of alteration of the stomach structure (NIDDK, 2016). Though the procedure is invasive, medical experts tout WLS as the most efficacious intervention for those that meet criteria for surgery as outlined by the American Society for Metabolic and WLS (Fouse & Schauer, 2016). In comparison to non-surgical interventions, WLS surgery results in 14% to 37% greater bodyweight-loss (Jensen et al., 2013). Although obesity equally impacts both men and women, only 10-20% of WLS patients are men (Johnson-Mann, Martin, Williams, Hallowell, & Schirmer, 2018). This is alarming given the fact that WLS is an efficacious intervention regardless of the sex of the patient (Jensen et al., 2013).

Traditionally, when considering men's underutilization of health services from a psychosocial perspective (e.g., Levant et al.,2009; Jeffries & Grogan, 2012)., researchers have considered the role of masculinity and social norms in men's help-seeking (Hammer, Vogel, & Heimerdinger-Edwards, 2013; Levant & Wimer, 2014; Vogel, Heimerdinger-Edwards, Hammer, & Hubbard, 2011). Yet psychosocial variables cannot fully explain underutilization of health services, as health-behavior is often motivated by severity and the salience of the health concern, and the subsequent appraisal process of whether or not behavior-change should be undertaken (Abraham & Sheeran, 2005). Conversely, healthcare research involving treatment-seeking and treatment compliance have examined this issue by examining structural barriers such as insurance or provider interactions, or using behavioral models, both of which often ignore the salience of social norms in the patient's decision-making process (Borkhoff, 2007; Cornally, & McCarthy, 2011, Fuchs et al., 2013; Imbus, Voils, & Funk, 2018; Primomo et al., 2016,). Furthermore, both psychological and health researchers have acknowledged that psychosocial, structural barriers, and behavioral attitudes contribute to men's treatment-seeking beliefs and behaviors (Wee et al., 2014; Vogel et al., 2011).

It is with an understanding of the contribution from health-behavior attitudes and psychosocial factors, that this research utilizes a modified health belief model, accounting for both domains. Specifically, this health belief model is extended by adding psychosocial variables to the model itself, thus spanning both psychological and health-behavior domains. The Health Belief Model (HBM) originally developed by Hochbaum, Kegeles, Leventhal, and Rosenstock (Rosenstock, 1974), was built on psychological expectancy-value theory principles, wherein appraisal of values and expectations inform subsequent behavioral outcomes (Abraham & Sheeran, 2005; Feather, 1980). The HBM was designed to provide a framework for explaining

why people would not engage in preventative health care practices, such as smoking cessation, dental care, flu shots, and colorectal screening (Abraham & Sheeran, 2005). It has also been used in weight management studies (Sapp & Jensen; Sapp & Weng, 2007), and diabetes management (Kartal & Ozsoy, 2007), both of which show similarities to the current study. In short, the HBM articulates a step-by-step appraisal and decision process, with the goal of informing health interventions. One of the reasons for the model's longevity is that the HBM has shown consistent predictive capability across a wide range of behaviors, with the revised model (Rosenstock, 1988) explaining up to 62% of the variance of the measured outcomes (Dorrian et al., 2017). The HBM has been widely used and shown to predict both health promoting behaviors (e.g. breast self-exams, diet & exercise) and attitudes and adherence to medical regimes (e.g. diabetes management) (Ali, 2002; Norman & Brain, 2005; Wdowik, Kendall, Harris, & Auld, 2001). The HBM has also successfully been used to assess attitudes that lead to weight-loss behaviors (Dedeli, Fadiloglu, Baya, & Kelimeler, 2011; Lambert et al., 2005).

The HBM also offers strengths specific to the nature of the current study's research questions where other popular models fall short. For example, Theory of Planned Behavior (TPB) (Ajzen & Fishbein, 1980) has often been used to examine health-behaviors, both by psychology researchers and medical researchers (Christy et al., 2017; Leone, Rovito, Mullin, Mohammed, & Lee, 2017). Yet TPB focuses on reasoned action and measures of behavior (Connor & Sparks, 2005) and, the underutilization of WLS will likely entail beliefs that may not be well reasoned, and even unconscious in the concerning male norms. Additionally, Social Cognitive Theory (SCT) (Bandura, 1977), which has also been used by both psychological and health researchers (Boman & Walker, 2010; Christy et al., 2017; Schwarzer, 2005), fails to appropriately consider barriers (Luszcynska & Schwarzer, 2005). SCT focuses largely on one's

observational learning and environment, hypothesizing that a person changes in tandem with their environment, which is not a consistent finding (Bandura, 1977; Luszcynska & Schwarzer, 2005). And as a third example, Social Norms Theory (Perkins and Berkowitz, 1986), which has been heavily utilized in masculinity research (e.g., Mahalik et al., 2003), does not provide an appropriate behavioral framework for our question as fails to take into account those barriers and benefits unassociated with social norms (Addis et al., 2010; Hamilton & Mahalik, 2009). While any model has its weaknesses, the extended HBM provides fewer weaknesses over other models with significant predicative capability.

Variables

The HBM posits that engagement in positive healthcare behaviors minimally requires four variables (Janz, & Becker, 1984). These four variables broadly include: sufficient value of health, belief that a health concern is severe and that one is susceptible to the concern, belief that one has the ability to undertake the health necessary change(s), and the belief that taking action would be beneficial in terms of benefit outweighing the costs (Janz, & Becker, 1984; Rosenstock, Stretcher, & Becker, 1988). Essentially, the model measures the impetus for evaluating a health concern (*Cues to Action),* perceived threats (*Health Concern Severity & Susceptibility*), perceived expectations (*Benefits, Barriers*), and perceived locus of control (*Self-Efficacy*) to predict outcomes (Rosenstock et al., 1988). In additional to these variables, proposed extensions to the HBM have included *Health Value & Importance, Masculine Self-Identity, Consideration of Future Consequences,* and *Appearance* (Orji, Vassileva, & Mandryk, 2012). These constructs have been shown to impact behavioral intentions, and with the exception of *Cues to Action,* were included in the current study. Though the underutilization of WLS in men,

is a complex problem, the combination of the traditional HBM variables and the extended HBM variables, which include psychosocial factors, is hypothesized to provide a greater understanding of the underutilization of WLS in men and contribute to current literature. Given this hypothesis, the following variables are discussed in relation to the men's *Consideration of WLS*.

Masculine Self-Identity

Social learning theories (e.g., SCT), and psychological theories of masculinity (e.g., Mahalik et al., 2003; O'Neil, 2008), would posit that men are conditioned to be self-reliant and even dominant (Addis, Mansfield, & Syzdek, 2010), providing support for the hypothesis that *Masculine Self-Identity*, may be a salient factor in our model. In short, men may be more likely to avoid help-seeking as it is against certain masculine norms. Furthermore, masculine norms might serve as a means to deny susceptibility to obesity-related health concerns (Bandura, 1997; Mahalik et al., 2003). Indeed, there is a wealth of literature showing gender disparities in utilization of healthcare services that highlights men's tendency to undervalue preventative healthcare (Christy, Mosher, & Rawl, 2014; Galdas, Cheater, & Marshall, 2005). Research largely shows that men engage in significantly less preventative care than women and tend to utilize health care primarily once they have perceived they have significant health issues (Galdas, Cheater, & Marshall, 2005). Men's tendency to delay or even foreclose help-seeking may serve to minimize the obesity-related threats.

Perceived Severity, Perceived Susceptibility, Health Value & Importance & Consideration of Future Consequences

Studies have found that health concerns deemed more exigent, such as cancer treatment, show no difference in utilization between men and women while preventative healthcare and

diagnostic services show a significant disparity (Galdas, Cheater, & Marshall, 2005). This would suggest that men indeed endorse *Health Value & Importance*. And while men may not access services as frequently, they may access them when the health concern becomes more significant in their minds (i.e., seen as a threat). Examining men's threat assessment will be captured within the variables *Perceived Severity* and *Perceived Susceptibility*. One possible contributing factor in men's underutilization of healthcare, is that men do not perceive severe obesity as a serious health concern (Duncan et al., 2011). Indeed, Duncan et al. (2011) found a significant number of men with obesity misperceived their bodyweight. These men, that reported themselves as not overweight or having obesity, were also less likely to report physical activity or any attempt at weight reduction in comparison to men that accurately assessed their weight (Duncan et al., 2011). If men do not believe obesity rises to the level of necessary intervention, they may not see a need to seek help (Leone et al., 2017). Additionally, despite more than 30% of men in the United States meeting criteria for clinical obesity, nearly 50% deny regular exercise, and more than 30% have been diagnosed with hypertension, only 12% of men endorse their health as poor to fair health (Heidelbaugh & Tortorello, 2012). This suggests that men frequently downplay the severity of different ailments and their susceptibility to them. Of course, threat assessment would also include *Consideration of Future Consequences*. In other words, a health issue is more likely perceived as a threat if a man also expresses concern over the future consequence of neglecting treatment. Such a man, who acknowledges all three, may be motivated to consider treatment. As such, understanding to what extent a man considers obesity to be a health concern, and the degree to which he considers his future are critical components to the model.

Self-Efficacy

The belief that one can undertake the behavioral changes needed to improve health can be conceptualized through measuring *Self-Efficacy* (Bandura, 1978). Self-efficacy is essentially defined as a person's confidence in his or her ability to successfully execute a particular action or behavior (Badura, 1997). The long-term behavioral changes necessary after undergoing weight-loss surgery are myriad. Broadly speaking, long-term changes include dietary behaviors, including water consumption, substance use, and physical exercise requirements (Mechanick, 2013). Thus, a man would have to be confident of his ability to persevere in long-term changes, some of which might conflict with a traditional masculine identity. For example, socially speaking men are more likely to consume large meals and meals high in saturated fat (Kiefer, Rathmanner, & Kunze, 2005). However, post-WLS surgery meals must be very small, and fat must be limited (Mechanick, 2013). As such, the perceived level of need for a change and anticipated *Benefits* must be significant enough to facilitate the motivation, and subsequently bolster confidence or *Self-Efficacy*, to engage in such behavioral change.

Barriers & Benefits

The benefits of weight-loss are certainly present, as there is considerable evidence that men value mobility and overall health, especially as it pertains to employment (Brantley et al., 2014; Monaghan & Malson, 2013). However, do these potential *Benefits* outweigh the costs, or *Barriers*? Indeed, while obesity in and of itself is a major health concern, there is clearly difficulty elucidating enough motivation for changes (Jasik, 2014). Thus, if behavioral changes were easily obtained, there would be no "obesity epidemic" (Mitchell, Catenacci, Wyatt, & Hill, 2011, p. 1). As such, the *Perceived Severity*, or *Health Value & Importance*, will clearly be only

one part of the decision-making process. Masculinity theories would suggest the cost of undertaking a surgical weight-loss procedure could undermine several important masculine norms. Some of the norms that might be in conflict are Self-Reliance, Risk-Taking, and Dominance (Mahalik et al., 2003). In a study of men's conformity to male norms in relation to health-behavior practices, Levant and Wimer (2014) found that high scores on the masculine subscale Risk-Taking was associated with less health promotion behavior. Furthermore, in a similar study, Salgado et al. (2019) found high masculinity subscale scores on Risk-taking and Self-Reliance were correlated with engaging in health-risk behaviors. And research by Leone et al. (2017) found men's attitudes regarding a physician's level of respect to be an important factor in help-seeking, further suggesting a salient role of masculinity variables. As such, the costs in terms of *Masculine Self-Identity* may not clearly be offset by the potential benefits of the health change.

Appearance

Another factor this study considers is the extended HBM variable of *Appearance* as it might contribute to *Consideration of WLS* (Santry, et al., 2007). The decision to engage in a weight-loss process is often influenced by negative social perceptions regarding excess bodyweight and internalization of social norms (Cash & Smolak, 2011). And although, from a social norms perspective, excess body weight is often viewed as a women's issue, as opposed to a men's issue, this is not always the case (Monaghan & Malson, 2013). In fact, the top three motivations for election to undergo WLS, as rated by men and women, included alleviation of health concerns, mobility, and appearances, and not always in that order (Brantley et al., 2014; Fung, Wharton, Macpherson, & Kuk, 2016). Yet literature on men's appearance concerns is mixed (Brantley et al., 2014; Monaghan and Malson, 2013; Tylka, 2011), and thus the role of

appearance in men's *Consideration of WLS* is unclear. Researchers have noted that men are often less hampered by the role of being a large person in comparison to their female counterparts, that experience greater stigmatization (Monaghan & Hardey, 2009; Celik, Lagro-Janssen, Widdershoven, & Abma, 2011). Indeed, this gendered experience of weight stigma is even seen in medical advice given; with men being recommended to lose significantly less weight than women, when controlling for BMI (Anderson et al., 2001). These differences in weight-stigma experiences may be in part due to the gendered nature of body image ideals; with women often assumed to idealize thinness, and men muscularity (Addis, Mansfield, & Syzdek, 2010). However, this does not conclude that men do not experience stigmatization. Furthermore, this buffer that masculinity may offer appears to dissipate if not disappear at Class II & III levels of obesity (Spahlholz, Baer, König, Riedel-Heller, & Luck-Sikorski, 2016). These findings suggest that the variable *Appearance* may contribute to the likelihood of considering WLS.

Concluding thoughts

The question of why men undergo WLS at such astoundingly low rates is complex. Clearly there are masculine identity variables that might impact whether a man thinks his health is at risk (Levant & Wimer, 2014; Mansfield, Addis, & Mahalik, 2003). Yet, even if a man perceives his health is at risk, would he think the benefits associated with the behavioral change outweigh the costs? And if benefits do outweigh the costs, does he have confidence that he can undergo the changes necessary with WLS? The answer to these questions is important for men's health. Broadly speaking, we consider what attitudes might correlate to a man's to consideration of WLS? Conversely, what beliefs might dissuade a man from surgery or even considering surgery? This study considers the variable *Masculine Self-Identity*, as a moderator of health-

behavior predictors. The problem explored through this research is, in a larger sense, one of healthcare disparities. And though men are not often thought of as victims in any sense, and particularly those from a majority ethnicity, the fact remains that there is a serious need to improve healthcare utilization for men. Connell and Messerschmidt (2005) aptly stated, "Without treating privileged men as objects of pity, we should recognize that hegemonic masculinity does not necessarily translate into a satisfying experience of life (p. 852)." As such, while men are not typically seen of as a population in need, statistics about shorter life expectancies and greater health risks tell a different story. Research into the impact of masculinity on specific health-behaviors provides an opportunity to craft strategies designed at increasing utilization of healthcare services. In pursuit of helping increase utilization of healthcare services, we ask the following questions.

1. Does the proposed extended HBM model predict men's *Consideration of WLS* at a statistically significant level?
2. Does a *Masculine Self-Identity*, as measured by CMNI subscales Risk-Taking, Self-Reliance, and Emotional Control, moderate the relationships between health beliefs (*Health Value & Importance*, *Barriers*), *Consideration of Future Consequences*, and *Consideration of WLS*?
3. Do appearance concerns, as measured by body fat dissatisfaction and muscularity dissatisfaction, significantly contribute to the consideration of WLS?

LITERATURE REVIEW

While a certain amount of overlap will occur, as researchers have often intertwined two or more of the themes, the literature reviewed is organized into the following categories: the health belief model, obesity and quality of life, weight-loss surgery, gender research theories, masculinity, men's health & help-seeking, and body image. The aforementioned themes will, I hope, contextualize this research area and provide insight into the significance of such research.

Health Belief Model

While sociological and psychological theories will be discussed in terms of understanding masculinity, social behaviors, and gender construction, a theory of health-behaviors is also necessary for understanding these research aims. This research is being framed within an extended version of the Health Belief Model (HBM). The HBM was developed by Hochbaum, Kegeles, Leventhal, and Rosenstock, out of Public Health research needs, in the late 1950s and early 1960s (Rosenstock, 1974). Rosenstock (1966), notably a primary author, stated that the HBM was a means of explaining why people would not engage in preventative health care practices, such as smoking cessation (Rosenstock, 1974). The model is known as an expectancy-value model, in which a person's motivational attitudes are developed based on an appraisal of beliefs and values, which subsequently predicts outcomes (Abraham & Sheeran, 2005; Feather, 1980). More precisely, the HBM posits that engagement in positive healthcare behaviors requires three things: sufficient motivation or health concern, belief that one is susceptible to the concern, and the belief that taking action is possible and would be beneficial (Janz & Becker,1984). For this last item, the assessment of action-taking as beneficial would not only consist of belief in health improvement but that this action-taking benefit would outweigh the cost. Cost refers to financial barriers as well as emotional and physical barriers (Janz & Becker,1984). The variables proposed in this initial model included five items: *Perceived*

Barriers, *Perceived Benefit*, *Perceived Susceptibility*, *Perceived Severity,* and *Cues to Action*, though Rosenstock (1974) noted that *Cues to Action* was ill-defined at the time.

Since its publication in the early 1960s, the HBM has been widely used and shown to predict behaviors that lead to positive behavioral changes and subsequent health-behaviors (Carpenter, 2010). Researchers often use the original HBM, less often the revised HBM, and even less often the revised HBM with extended variables (Carpenter, 2010). Carpenter (2010) conducted a meta-analysis on the effectiveness of the original HBM (i.e., without Self-Efficacy) and the revised HBM to determine what components most contributed to predictive capability. Carpenter (2010) found that *Susceptibility* was often unrelated to behavior and *Cues to Action* often only had an impact when the study was longitudinal. In large part, *Barriers* and *Benefit* were found to be strong predictors of behavior. Carpenter (2010) concluded that the revised HBM should be used, thus including *Self-Efficacy*, to increase predictive capability of the model. Additionally, a review by Daddario (2007) of the original HBM, in the domain of weight management, the variable of *Perceived Severity* did not lead to weight-loss behavior simply because the participants did not identify obesity as a serious health condition. This finding is consistent with other men's healthcare utilization literature, in that attitudinal barriers are often the significant factor in delayed help-seeking rather than structural barriers such as time or money (Galdas et al., 2005; Leone et al., 2017).

Research on the revised model has shown greater predicative capacity than the original HBM (Dorrian et al., 2017). However, it is not always clear which variables contribute most substantially to predictions, which may be in part due to differences in the health-behaviors and in the populations studied (Orji et al., 2012; Wdowik, Kendall, Harris, & Auld, 2001; Zetu, Zetu, Dogaru, Duta, & Dumitrescu, 2014). For example, Zetu et al. (2014) tested the revised HBM

model to examine predictive ability in oral care between men and women. The authors found that men reported *Perceived Barriers* to be a significant predictor, more so than women (Zetu et al., 2014). Furthermore, for women, but not men, *Perceived Severity* and *Perceived Susceptibility* were correlated with positive oral hygiene behaviors. *Perceived Severity* has been found in other literature to be a predictor for women's health-behavior, more so than men's health-behavior (Norman & Brian, 2005). This finding is not surprising given literature has shown men to both minimize the severity of illness as well as perceive themselves as less susceptible to ailments (Christy et al., 2017; Galdas et al., 2005; Leone et al., 2017). Yet, combining *Severity* and S*usceptibility*, or even eliminating one or the other violates the original expectancy-value framework that informed the model, thus producing inferior results (Abraham & Sheeran, 2005). Given these differences, there have been increasingly more studies incorporating additional variables into the revised HBM, thereby effectively extending the model.

Researchers have incorporated other variables into the revised HBM, extending the model based on the research question at hand (O'Connor, Weeks, & Ong, 2014; Wdowik et al., 2001). A study by Orji et al. (2012) tested the original HBM, the 1988 revised HBM, and a new extended version of the HBM to determine which model predicted healthy-eating behaviors in a sample of 559 adults. The authors included four variables to the model: *Self-Identity*, *Perceived Heath Importance*, *Consideration of Future Consequences*, and concern for *Appearance*. The authors determined that the 1988 revised HBM improved predictive capacity from the 20% predictive capability of the baseline HBM to 40%. Furthermore, regarding the baseline model, *Barriers* and *Susceptibility* were the greatest predictors of behavior. However, an extended model increased predictive capacity from 40% (in the 1988 revised HBM) to 78% in the Orji et al. (2012) extended model. The model's predictive capacity was improved by all four of the new

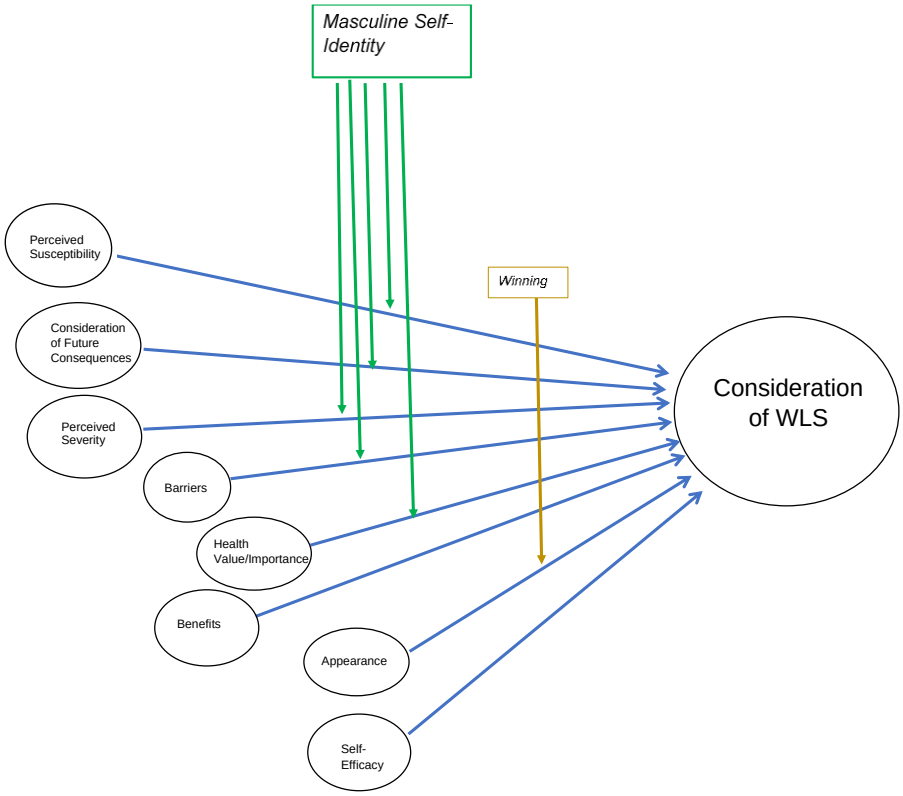
variables added in the new extension. Additionally, the authors found that self-efficacy was the strongest predictor both in the 1988 revised model and the newly proposed extension (Orji et al., 2012), a finding consistent with Zetu et al. (2014) wherein authors found *Self-Efficacy* was the primary predictor of behavior (Zetu et al., 2014). These findings support using a revised HBM model (i.e., including *Self-Efficacy*) and adding extensions specific to the research at hand.

Christy et al., (2014) proposed an integrated masculinity theory and several health-behavioral models, including the HBM, to examine the likelihood of men engaging in colorectal cancer screening. Christy et al. (2014) acknowledged the necessity of including masculinity variables in a study examining men's behaviors and attitudes. As such, the authors integrated the male gender constructs within a health-belief model. The authors proposed that factors such as self-reliance would be particularly salient in the healthcare field and should be specifically integrated into existing health-behavior models. And lastly, concerning masculinity, the aforementioned study by Mahalik and Burns (2011) utilized an extended HBM in masculinity studies. In line with Mahalik's (2003) theory of gender norms, the authors extended the HBM to incorporate both gender norms and normative health-behaviors. As both gender norms and socially normative health-behaviors have been found to predict likelihood of engaging in health-promoting behaviors, this integration provided useful in understanding men's heart health-behaviors (Mahalik et al., 2011; Mahalik et al., 2014).

The model used in the current study, shown below in *Figure1*, was informed by previous HBM studies and a review of relevant literature. This proposed model consists of the following variables: *Perceived Susceptibility, Perceived Severity, Consideration of Future Consequences, Barriers, Health Value & Importance, Appearance, Benefits, and Self-Efficacy*.

Figure 1

Proposed Extended HBM Model



Obesity and Quality of Life

Physical Health Impact

As previously discussed above, obesity is considered a medical condition known to contribute to serious health risks including metabolic syndrome, osteoarthritis and cardiovascular disease (Kiefer et al., 2005). Research on obesity has considered both the physical impact of obesity as well as the psychosocial impact of living in a society that stigmatizes weight (Puhl & Heuer, 2010). Our focal point, in this review of literature is to acknowledge the health and psychosocial impact of obesity on men, including the negative impact of living with the stigma of being a person with obesity. This information is relevant in terms of understanding populations of men that may be eligible and benefit from surgical weight-loss intervention. In

considering obesity, it must be clearly noted that presence of obesity does not indicate presence of an eating disorder or mental dysfunction (Marcus, 2018; Marcus & Wildes, 2009). Indeed, obesity develops for a magnitude of reasons with genetic roots strongly influencing the likelihood of obesity (Cash & Smolak, 2011). Furthermore, metabolic syndrome frequently occurs in populations that simply prefer to eat only once or twice a day (Macpherson-Sánchez, 2015; Nagata Garber, Tabler, Murray, & Bibbins, 2018). As such, obesity is a multi-faceted condition that is often difficult to treat.

While one of the biggest health impacts obesity can have is in relation to hypertension, hypertension is not something easily observed and is therefore be minimized as less severe and/or ignored (Chobanian et al., 2003). Mobility, on the other hand, impacts daily functioning and is therefore much more likely to be a significant factor in quality of life (Kolotkin, Head, Hamilton, & Tse, 1995). For example, obesity might impact one's ability to get dressed in the morning or walk up a flight of stairs (Kolotkin et al.,1995). A study by Yancy, Olsen, Westman, Bosworth, and Edelman (2002) found that higher BMI was significantly associated with lower quality of life physical domains in a study of men. What is especially informative about this study is the authors controlled for co-morbid illnesses, thus assessing the unique contribution of excess bodyweight (Yancy et al., 2002). Yancy et al. (2002) found that men with BMIs ≥35 kg/m2 reported with lower physical functioning and men with ≥25 kg/m2 reported greater body pain in comparison to normal bodyweight men. Additionally, a meta-analysis by Ul-Haq, Mackay, Fenwick, and Pell (2013), of both women and men, found BMI to be associated with lower quality of life in both physical functioning and mental health domains. This suggests that BMI can also impact mental aspects of quality of life. Furthermore, Ul-Haq et al. (2013) did not find any differences across sexes.

In addition to mobility issues, there are medical co-morbidities that might negatively affect quality of life. For example, research has shown obesity to related to poor sexual quality of life, with men reporting lower sexual satisfaction and increased erectile dysfunction symptoms (Kolotkin et al., 2006). Obesity can also cause sleep apnea, which can cause poor quality of sleep and subsequently negatively impact mood (Lagrotte et al., 2016). In fact, a longitudinal study, Lagrotte et al. (2016) found a relationship between sleep-apnea and depression. The study found that obesity had led to sleep-apnea which in turn led to daytime sleepiness and dysregulated circadian rhythms, resulting in depressive symptoms (Lagrotte et al., 2016). While greater time could be devoted to exploring co-morbities associated with obesity, it is clear that there are many and they impact men's quality of life.

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Weight Stigmatization

Another very important consideration regarding the impact of obesity is the social stigmatization of obesity. Research has repeatedly identified ways in which individuals with obesity are discriminated against in social and professional settings (Puhl & Heuer, 2010; Spahlholz et al., 2016). Some feminist research has also considered the social use of obesity discrimination as a way of reinforcing hegemonic masculinity, which can negatively impact both men and women (Bordo, 2004). Distress resulting from stigmatization might involve personal interactions, with negative comments from peers, family or romantic partners (Kolotkin, Crosb, Kosloski, & Williams, 2001. Additionally, public interactions, such as taking a seat on an airplane or eating a meal in public, might give cause for distress (Kolotkin, et al., 2001). Actions that many people take for granted every day might be cause for concern in someone with severe obesity. Indeed, discrimination is not merely present in social interactions but also in educational and employment settings. MacCann & Roberts (2013) found that students with obesity scored equal to their non-obese peers on standardized tests but received lower grades in comparison to non-obese peers. In turn, the authors found that students with obesity were less likely to have high educational or career aspirations (MacCann & Roberts, 2013). Additionally, researchers have found individuals with obesity are less likely to be hired and receive promotions (Glass, Haas, & Reither, 2010; Roehling et al., 2009).

While many studies show women are more likely to report weight discrimination, a meta-analysis showed that gender differences are not always consistent. Furthermore, reporting of weight discrimination does not necessarily translate to greater occurrence of weight discrimination. Spahlholz, Baer, König, Riedel-Heller, and Luck-Sikorski (2016) found that while gender differences were found at BMIs with only moderate levels of obesity (i.e., Class I

obesity), once BMIs reached above 35 (i.e. Class II obesity), which is the lowest qualifying BMI for WLS, gender differences were inconsistent. Two suggestions were made by Spahlholz et al. (2016) to explain this inconsistency. Firstly, while obesity may indeed be more socially accepted in men versus women, this acceptance may only extend to a certain degree, given that studies have also found gender differences to disappear with extreme obesity (defined as Class II and III obesity) (Spalholtz et al., 2016). This finding is in line with a study by Roehling et al., (2009) which found differences in overweight female CEOs in compared to overweight male CEOs but found no differences in the low prevalence of CEOs with obesity, being at 5% for both men and women. The second suggestion made by Spalholtz et al. (2016) was that a person's perception or awareness that one is part of a stigmatized group introduces confirmation bias wherein he or she is more ready to expect and interpret things as discriminating against the person (Spahlholz et al., 2016). This is suggestion has found support in other research. For example, a study by Forsthe & Moore (2012) found that obesity and life satisfaction was mediated by the individual's social influences. In other words, the life dissatisfaction was present only when the individual perceived obesity as negatively viewed by those in the person's social group. Thus, if men are less likely to expect discrimination, they may be less likely to experience adverse events as discrimination. The level to which a man experiences weight stigmatization may be lower than that of a woman. However, research suggests that this protection offered by social norms dissipates as BMI increases (Spahlholtz et al., 2016; Roehling et al., 2009). While we hope social norms will evolve to become less discriminatory, currently the experience of weight discrimination is our reality. As such, this discrimination is important to consider as it may be a motivating factor for some individual's consideration of WLS. For example, if one experiences significant discrimination, they may be inclined to perceive lessened discrimination to

accompany weight-loss. Again, while this desire to escape discrimination is an unfortunate reality in our society, in HBM terms, this could be described as a perceived benefit to losing weight.

Food Choices

Food choice is important in terms of understanding a potential barrier toward behavioral changes. Not only does food choice contribute to obesity, but it can be difficult to change in order to reduce bodyweight. Research has highlighted the overabundance of meat and high fat foods as contributing to male-specific obesity. In fact, men are statistically more likely than women to have excess visceral fat (Kiefer et al., 2005). Visceral fat is fat surrounding the bodies organs, whereas subcutaneous fat is fat just below the skin and outside of the muscle girdle. Visceral fat is associated with more health consequences than subcutaneous fat, such as heart disease and type II diabetes (Kiefer et al., 2005). Indeed, research has found that men tend to overeat high fat savory foods, such as fatty meats, whereas women tend to prefer carbohydrate dense foods (Kiefer et al., 2005). Furthermore, Kiefer et al. (2005) found that while both women and men enjoy sweets, women rated sweets as more enjoyable than men did. While some the taste preferences may be biological, there is a strong argument for the role of hegemonic masculinity in eating behaviors. Calvert (2014) makes the case for this relationship by highlighting the primitive social messages innate in meat consumption. Calvert (2014) argues that dominance over nonhuman animals is an illustration of power, dominion and authority.

The masculine concept of hunting for food is still present in modern-day meat consumption (Love & Sulikowski, 2018). Marketing campaigns prey on this image as large-portioned burgers or steaks are marketed as a man's meal (Love & Sulikowski, 2018). As such, social norms and messages about what constitutes a man influences eating behaviors;

specifically, types of food consumed and portion-sizes. Additionally, as masculinity directly opposes femininity under hegemonic masculinity (O'Neil, 1987), large portions of red meat and high fat food are opposite of the feminized smaller portioned low-fat diets. As such, men engaging in consuming of lighter fare run the risk of losing some of their masculine image by departing from the hegemonic ideal. In addition to having less nutritious dietary habits in comparison to women, men also report drinking more alcohol than women, both in frequency and quantity (Kiefer et al., 2005). This finding is not surprising given the noted association between masculinity and consuming alcohol (De Visser et al., 2009). These findings illustrate the potential barrier that food plays in weight reduction and the decision to make behavioral changes. The social aspect of food in particular, with masculinity being associated with certain types and quantities of food, can be a challenging barrier.

Weight-Loss Surgery (WLS)

WLS is arguably the most efficacious medical obesity intervention for patients with class II and III obesity that have repeatedly failed diet and exercise attempts (Fouse & Schauer, 2016). While there are several approaches to the surgery, in short, the procedure involves removing or restricting a portion of the stomach to reduce the volume of food intake possible (Heber et al., 2010; Mechanick et al. 2013). The smaller stomach size and subsequent lessened food ingested results in significant weight-loss in the six months to one year following WLS (Mechanick et al. 2013). The WLS process involves a very strict diet both immediately post-operative and to a lesser extent ten months or so after surgery. This diet consists of small and frequent meals, plenty of water, and at a certain amount of protein daily (Heber et al., 2010; Mechanick et al. 2013). Given the invasiveness of the surgery and the strict diet, there are very specific criteria for being considered for WLS.

Minimum requirements for WLS are agreed upon and defined by the American College of Cardiology (ACC), American Heart Association (AHA), and the American Society for Metabolic and WLS (ASMBS). These requirements: either BMI of ≥40, or greater than 100 pounds overweight, or a BMI ≥ 35 and at least one co-morbid diagnoses thought to be caused by obesity, and an inability to reach and maintain a healthy weight (ASMBS, 2019). These requirements basically specify that surgery is only available for those with class II obesity and documented obesity-related disease, or class III obesity. Additionally, most hospitals and many insurance companies require psychological and dietary clearance (ASMBS, 2019).

According to the obesity treatment guidelines produced by the AHA and ACC, WLS produces approximately 20%-35% bodyweight-loss in patients, with some procedures producing more and others more conservative (Jensen et al., 2014). In comparison, nonsurgical interventions, consisting of dietary and physical activity changes produce approximately 2-5% reduction in body weight. Furthermore, when combining pharmaceutical intervention and behavioral support with dietary and physical activity changes, weight-loss is still only 5-10% (Jensen et al., 2014). The nonsurgical interventions are often not large enough to produce necessary health changes, such as lowering one's A1C (Jensen et al., 2014). However, WLS often has tremendous impact on obesity comorbidities. For example, incidence of both type II diabetes and hypertension is greatly decreased and, in many cases, remitted among patients that have undergone WLS (Jensen et al., 2014). Indeed, mortality risk itself is decreased at 11-year follow-ups post WLS in comparison nonsurgical groups (Jensen et al., 2014). Yet, despite this intervention being highly effective, less than 20% of WLS procedures are performed on men (Johnson-Mann, Martin, Williams, Hallowell, & Schirmer, 2018). This percentage is even more

alarming when keeping in mind the high prevalence of mortality in men due to hypertensive heart disease (Center for Disease Control, 2017).

Men and WLS

Literature on men's experiences with WLS is both sparse and limited in generalizability. This may in part be due to the fact that so few surgeries are performed on men (Johnson-Mann et al., 2018). Additionally, men who had the surgery may not have the same attitudes toward WLS as men who would not choose to have the surgery. The research that has been conducted has been largely qualitative and has focused on men's attitudes, barriers and experiences. The general themes that have emerged from this body of literature fall under categories of lack of knowledge about WLS, stigma surrounding WLS (e.g., the feminization of weight-loss), discomfort seeking help or utilizing social supports, and motivations for WLS. In terms of HBM constructs, these themes fall under *Barriers, Benefits, Consideration of Future Consequences*, and *Cues to Action.*

Lack of knowledge

One area of interest in WLS literature is how men are exposed to the concept of WLS. This information is important as it may help explain access to these healthcare services. Of the limited literature available on men and WLS, it appears that exposure is likely to happen outside of a healthcare interaction.

A study by Moore, Cooper, and Davis-Smith (2016) examined the way in which men understood WLS and how information had been disseminated to them. This research, while small and qualitative in nature, examined attitudes of men who meet criteria for WLS, yet the

sample was not comprised of men within a WLS program. This method is useful in understanding men in general, rather than men who have already chosen to undergo surgery. Additionally, Moore et al. (2016) used a sample of African American men in contrast to previous literature comprised of predominately Caucasian samples. Men discussed hearing stories about surgery from friends or distant family members, and often had heard stories of death, despite WLS rarely causing mortality. Participants noted there was a general lack of knowledge about surgery. One participant stated this might be in part due to the resistance African American men have going to the doctors (Moore et al., 2016). Other participants stated their physician had not discussed their obesity with them, let alone treatment recommendations such as WLS (Moore et al., 2016). This finding is consistent with other literature that has found physicians often fail to address obesity in men (Forman-Hoffman, Little, & Wahls, 2006). In short, there is a general lack of education provided regarding obesity treatment.

Similarly, Edward, Giandinoto, Hennessy, and Thompson (2018) found men reported learning of WLS from friends and family, rather than a healthcare provider. Additionally, research by Jose et al. (2017) found that men reported their weight to be minimally discussed by healthcare providers and even validated in some circumstances. One man noted that while his doctor said he technically should be at a lower body weight, the doctor quickly added that he had a large frame to carry the weight (p.120). Contrastingly, women reported being told to lose weight, and having their weight be a constant subject for discussion (Jose et al., 2017). Men in the focus group even reported feeling generally unconcerned about their health (Jose et al., 2017). Perhaps, given the findings reported, it is possible men are less concerned about health because their doctors are less likely to be aggressive about weight management. This might also

suggest that healthcare providers are unlikely to act as a *Cue to Action*, in order to motivate a man to undergo WLS.

Motivations for WLS

Edward, Giandinoto, Hennessy, and Thompson (2018) conducted a qualitative study with a sample of men in Australia, post-WLS. The researchers examined attitudes toward the surgery and post-operative results. Regarding motivation for having the surgery, men described health as their primary reason. The participants discussed having very unhealthy eating habits prior to the surgery, which resulted in co-morbid conditions such as heart disease and diabetes. Men discussed a fear of being a burden to their families, with all their health issues, and a need to make a change (Edward et al., 2018). This finding is consistent with other male norms wherein a man is seen as a provider not someone that needs to be provided for (Mahalik et al., 2003).

Groven, Galdas, and Sobraekke (2015) interviewed a sample of men post-surgery on how they perceived WLS and their post-surgical bodies, and found men had positive attitudes, which was similar to findings by Sabinksky et al., (2007). Groven et al, 2015) specifically examined men's attitudes towards their physical bodies both pre- and post-surgery. Men described feeling more in control of their lives post-surgery, having an increased knowledge of how to manage their body weight. Furthermore, many men discussed the role of physical exercise as helping them feel better and improving their self-esteem. This finding is consistent with other literature that highlighted the need to improve physical performance, and subsequently job performance, as part of masculine ideals (O'Brien et al., 2005). The surgery was seen as a tool that allowed men greater control over their bodies, therefore reinforcing masculine ideals such as self-reliance.

A study by Brantley et al. (2014) provided some interesting data in terms of parsing out challenges and motivations of WLS patients. The authors explored motivations and barriers for undergoing surgery in a sample of 360 participants, including men and women. The sample consisted of people that volunteered to undergo WLS with the cost covered by their insurance company. However, despite this access, and consistent with WLS literature (Miller-Matero, Tobin, Clark, Eshelman, & Genaw, 2016), the sample was comprised of 86% women and only 14% men, all of whom were predominately Caucasian (62%). The authors found that the top reasons for pursuing weight-loss surgery were health concerns, medical conditions and physical fitness, all of which tend to overlap. These reasons were endorsed highly by 80% of the sample. Surprisingly, 21% of participants, both men and women, ranked appearance as one of their top three reasons for pursing surgery, with women were more likely than men to rank appearance as a number-one motivation (Brantley et al., 2014). Lastly, only 13% of participants ranked insurance coverage as being a motivation for surgery, suggesting that cost may not be a large deterrent to many WLS-eligible men and women. This finding is consistent with other health literature wherein attitudinal barriers are more impactful than structural barriers (Oleski et al., 2010). Additionally, many insurances, including Medicare, cover the cost of WLS, which make it accessible to many people (National Heart, Lung, and Blood Institute, 2013).

A study by Jose et al. (2017) utilized single-gender focus groups to explore the experiences of both male and female patients that have undergone WLS. The authors found that men were more likely to see their weight as a result of an injury or lack of employment, whereas women were more likely to internalize guilt and shame about their size (Jose et al., 2017). And unlike women, men were primarily concerned with improving their functionality and potentially regaining employment. This is consistent with other research. For example, Sabinsky, Toft,

Raben, and Holm (2007) found men wanted to lose weight in order to improve performance at their jobs, which were largely skilled laborer positions. The relationship between physical performance and masculinity has also been found in masculinity literature (De Visser, Smith, and Mcdonnell, 2009; O'Brien et al., 2005). As such, it is not surprising that Jose et al. (2017) found men tended to be lighthearted about their sizes, making jokes, while women were more likely to speak unkindly about their bodies. One woman noted how a large belly on a man would be dismissed as a "beer gut" when a large belly on a woman would likely be criticized (p. 120). Men were also more likely to speak of their size with some pride, specifically noting the benefits that came with being a large man (Jose et al., 2017).

Lastly, a study by Groven and Braithwaite (2016) found that WLS program advertisements projected an athletic-looking male playing sports when marketing WLS to men. As seen in other literature, the goal of men improving performance and functionality was used as a selling point (Jose et al., 2017). While not being a direct measure of motivation for surgery, the gendered theme is evident. This style of advertisement is a reinforcement of hegemonic masculinity, in which a man's body is to be used for obtaining power. As men are more likely to have significant co-morbidities upon entering a WLS program (Kochkodan, Telem, & Ghaferi, 2018), it is likely that many men would not achieve such a high level of physical activity post-surgery. In contrast, women were targeted in advertising by using before and after photos, featuring women dressed nicely and wearing make-up post-surgery. Again, this reinforces the socially perceived gendered differences in motivations for surgery that arise from traditional masculine and feminine norms.

In summation, men generally reported that improved health and/or functionality as the main reason they are pursuing surgery (Brantley, et al., 2014; Edward et al., 2018, Moore et al.,

2016). This might suggest that *Cues to Action* consist of presence of co-morbidities and self-reported negative quality of life impact experienced by obesity. This would also suggest that men's *Consideration of Future Consequences* and even *Perceived Susceptibility* are salient, as both health consequences may be considered in choosing to pursue surgery.

Discomfort in help-seeking & utilizing social supports

In a study by Temple-Newhook, Gregory, and Twells (2015), men eschewed social support groups and often stated they would not tell other men about WLS while female participants discussed social support, in the form of friends, loved ones or a WLS support group as being essential to the process. Alternately, Temple-Newhook et al. (2015) highlighted how this reinforced the idea that WLS is a social and feminine process. Of those men that did not see support groups as inherently negative, there was a sense of isolation, given the overrepresentation of women in support groups and the lack of male experiences shared.

Moore and Willis (2017) also studied men's experiences with available supports throughout the WLS process. The authors utilized a qualitative approach and specifically assessed for supports outside of men's families. Moore and Willis (2017) found that men reported a lack of support beginning with the mental health provider in their initial consultation. Men reported that in addition to mental health stigma and financial barriers of WLS, they felt the healthcare professionals were not prepared for male patients. Furthermore, men saw meeting with mental health professionals as a hurdle to cross, in order to qualify for surgery, and with few exceptions did not return for follow-up appointments post-surgery.

Moore and Willis (2017) found that 90% of the men in the study reported that men in general have difficulty asking for help. The participating men discussed this difficulty asking for

help as being an added barrier on top of the female-centric structure of WLS programs. Only 20% of the men reported attending a support group by themselves, and those men discussed face-to-face support groups as largely female. The majority of men reporting finding great support through online services. Some men used their real names while other did not, preferring to anonymous (Moore & Willis, 2017). This writer would posit that this marked increased comfort in an online format suggests gender role conflict may exist for men interested in WLS and anonymity alleviates some of the strain associated with this conflict.

Stigma surrounding WLS and the feminization of weight-loss

Another common theme within the literature on WLS is the stigma surrounding surgery and the social perception of weight-loss, and even health interventions in general, being inherently feminine (Lee & Frayn, 2008; Moore et al., 2016). Moore et al. (2016) found a clear influence of masculinity and social norms on the *Consideration of WLS*. Men in the study suggested that men, in general, might not want WLS simply because it seems like a 'feminine' procedure (Moore et al., 2016). Indeed, one participant described the surgery as cosmetic (Moore et al., 2016). Despite this assertion of WLS as cosmetic, the surgery, while elective, is not considered a cosmetic surgery. However, this perception strongly ties into the body image literature wherein men discussed body insecurities as primarily a woman's concern (Monaghan & Malson, 2013).

In a study of post-surgery men, by Edward, Giandinoto, Hennessy, and Thompson (2018), participants reported feeling like WLS was viewed as feminine, which would essentially work as a barrier toward considering surgery. The authors reported this was a common theme: men felt there was a stigma towards men that consider WLS. One participant stated he felt like

he looked weak for not being able to diet or lose the weight on his own (Edward et al., 2018). Indeed, some men reported keeping having had WLS a secret for this reason. Furthermore, men reported that the medical supports, services, and resources often seemed to be gendered, catering more to a female patient. This in turn reinforced the feeling that the surgery is inherently feminine. Interestingly, Edward et al. (2018) found that though men described themselves in negative and pejorative ways, most of them denied any significant body image issues. Instead, men stated they just didn't think on it, or ignored it, which is again, consistent with other literature (Monaghan & Malson, 2013). Men did, however, report feeling concerned with other's evaluations of them as being lazy. Furthermore, men also reported a larger size was sometimes beneficial in certain settings, such as protecting them physically from harm. These findings are consistent with findings by Monaghan and Malson (2013) wherein the experience of being in a large body is subject to contextual variables.

Sabinsky et al. (2007) also found that men described leanness as being a feminine issue and dieting as something men don't discuss. Furthermore, while men reported wanting to lose weight, they also discussed concerns about looking small and how that may be perceived as less masculine. Men's motivation toward weight-loss seemed to be ambivalent given the conflicting gendered messages: to be masculine is to perform well physically, yet to lose weight via dieting is considered feminine.

Temple-Newhook, Gregory, and Twells (2015) explored WLS utilization, using a feminist model, and found valuable information about the male experience. The authors argued that fat has been a gendered phenomenon for years, with fat having been labeled an inherently a feminine issue (McPhail, 2009; Temple-Newhook et al., 2015). From this understanding, the authors conducted over 50 interviews with a sample of 27 weight-loss surgery candidates (WLS)

to explore their discourse on WLS. The authors noted that, in line with other research, female participants regarded WLS as a tool to care for their health and often times to improve self-image. In discussing self-image, Temple-Newhook et al. (2015) found that while none of the women described themselves in positive terms, men would describe themselves as powerful, strong, and big. This finding is consistent with other research that has found bigness lends to masculinity more than femininity norms (Monaghan & Malson, 2013). Indeed, men also discussed their struggle with changes in eating practices post-WLS, stating that men had greater changes to overcome since they eat much more than women. The authors found that both men and women gendered the discourse on eating and the dietary changes necessary for WLS.

While men may be interested in losing weight, they also report a hesitancy to undergo surgery due to the perceived stigma associated with the surgery (Sabinsky et al., 2007; Temple-Newhook, Gregory, & Twells, 2015). This stigma comes in several variations, such as WLS being considered feminine or that undergoing surgery means men are not tough enough to lose the weight on their own (Temple-Newhook et al., 2015). However, in general each variable represents a conflict with masculinity. For example, being too weak or not tough enough conflicts with the masculine traits Winning and Self-Reliance. This has been a finding consistent in help-seeking literature, especially research regarding prostate cancer or erectile dysfunction (Chambers, et al., 2016). These barriers discussed above reflect attitudes rather than structural barriers. With only 13% of men and women reporting lack of insurance as a barrier to surgery, and many insurance companies covering the surgery and aftercare nearly entirely, the barriers are largely psychosocial (Brantley et al., 2014).

Theories for understanding gender research

The most common theoretical understandings involving masculinity come from both psychology and sociology, and for good reason. If we believe that masculinity is a social construct, it makes sense that theories stem from social psychology and sociology (Berger & Luckmann, 1967). One of the common theories through which gender research is viewed is social constructivism (e.g., Berger & Luckmann,1967; Courtenay, 2000). Social constructivism was born from sociology and feminism, and primarily considers gender to be a verb rather than a noun (Berger & Luckmann, 1967; Deaux & Major, 1987; Shields & Dicicco, 2011). In other words, one would *do* gender, not *be* a gender (Deaux & Major, 1987). To explain this perspective further, consider the act of speaking with another person. Each person has a set of attitudes, values and expectations that are present in any given interaction. As such, a simple conversation has the power to initiate and reinforce gendered behavior based on a reciprocal interaction (Shields & Dicicco, 2011). In this way, gender is an action being completed within a specific context. This theory (e.g., Berger & Luckmann, 1967) accounts for the dimensional nature of gendered or non-gendered behaviors. Meaning, it can help explain why someone who endorses traditional masculine attitudes and behaviors might become emotional and cry, despite emotionality being considered non-masculine (Mahalik et al., 2003).

Another theoretical approach that continually surfaces in gender studies is Bandura's (1977) SCT, which is another sociological theory. Bandura's (1997) SCT provides an appropriate theoretical framework for examining gendered behaviors. SCT posits that a person's learning process involves a very complex and dynamic reciprocal interaction between the person and the person's environment (Bandura, 1978). Within the SCT approach, social interactions, both done and observed, would set the stage for observational learning, outcome expectations, and reinforcements. These concepts help explain the socially contextual interaction among an

individual, the environment, and the individual's own abilities and characteristics. Observational learning entails learning what behaviors are accepted and occur in a given environment and mimicking those behaviors. In contrast, opposing acceptable behaviors would lead to negative outcomes. The encouragement or discouragement of certain behaviors is known as reinforcement and comes from the behaviorist school of thought (Skinner, 1969). SCT argues that reinforcements are what motivate people to continue or discontinue a certain behavior (Bandura, 1988). While reinforcements can be an internal process, such as internalizing values and self-monitoring, they can also be external, such as receiving praise for an athletic accomplishment or having a harsh punishment for a masculinity violation (O'Neil, 2015). Thus, social institutions, such as work or school, are in an ideal position to create a system that reinforces socially acceptable behaviors or even punish those that are deemed unacceptable. For example, researchers have documented many instances in which desired masculine behavior is positively reinforced in work or school settings through social practices (Connell, 2002). Likewise, research has also found that being engaged in a gender incongruent occupation is likely to be socially punished (Brescoll, Dawson, & Uhlmann, 2010). This reinforcement might come in the form of hazing or homophobic slurs as a way of trying to stop the behavior deemed unacceptable. This concept underscores the importance of observational learning in the development of masculinity as a social construct by which and against men are measured. Thus, using the SCT approach, gendered behaviors are either encouraged or discouraged through social interactions and subsequent internalization of acceptable norms.

Concerning social norms, there are arguably some socially accepted behaviors and traits that are deemed masculine. Indeed, one of the most central concepts to masculinity, which stems from the larger sociological gender order research (e.g., Carrigan, Connell, & Lee, 1985), is the

concept of hegemonic masculinity. This term was discussed by Carrigan et al. (1985) to refer to the dominating effect that accompanies the traditional masculine ideology of a particular place and time. The authors postulated that hegemony, refers to a historical situation, a set of circumstances in which power is won and held. The construction of hegemony is not a matter of pushing and pulling between ready-formed groupings but is partly a matter of the formation of those groupings" (Carrigan et al., 1985, p. 594). This concept was further developed and discussed by Raewyn Connell (1987) who discussed how this particular identity is used to socially and politically oppress both females and other males. Hegemonic masculinity is therefore socially constructed and reinforced and used to justify various types of oppression (Connell, 1987). This concept not only describes gender as socially constructed and variable based on the culture, but also accounts for the reciprocal interaction between people and their social environment (Berger & Luckmann, 1967). Within hegemonic masculinity, as noted above, men are also oppressed, particularly those men that reject traditional masculine ideology (Mahalik et al., 2003).

While hegemonic masculinity is considered the pinnacle of masculine ideology, it is important to discuss what ideals combine to form masculine ideology. In doing so, we shift from sociological theories to psychological theory. Pleck's (1981) Gender Role Strain Paradigm (GRSP) provides perhaps the most common framework for understanding both masculinity and the strain from masculinity. Pleck's GRSP also proposes the social construction of masculinity rather than claim it as an innate set of traits. This flexibility allows for masculinity to vary by interaction, situation and across time. Common expectations for men and valued traits combine to create what is considered traditional masculine ideology (Pleck, 1981; Levant, 2011).

Traditional masculine ideology (TMI) impacts both men and women in a variety of ways. Some of the broad ways researchers examine masculinity are to consider the degree to which a man subscribes to such TMI and the consequent levels of stress that may result by subscribing or not subscribing to different ideals (Pleck, 1981). Of course, at the apex of TMI sits hegemonic masculinity. Pleck argued that men can experience three types of strain: gender role discrepancy strain, gender role dysfunction strain and gender role trauma strain (Pleck, 1981). Pleck (1981) noted that men may fall short of certain TMI variables, such as being a man not interested in traditional male careers or activities. Or a man may experience situations in which a particular TMI variable no longer serves him. In this scenario, a man may rely on aggression to obtain something only to find himself fired from a job. And regarding gender role trauma strain, a man may experience negative psychological effects simply from surviving the social gauntlet that prepared him to fulfill TMI (Pleck, 1981). This might result in his having limited emotional expression and difficulty communicating with intimate partners. Pleck's argument is that strain is produced when men attempt to go outside constrained masculine ideologies. And, furthermore, masculine ideology is so rigid and contradictory that men most certainly will step outside this ideology at times (Kieselica, Benton-Wright, and Englar-Carlson, 2016).

As this strain is central to our understanding of men's health and subsequent health-behaviors, understanding the constructs that comprise masculine ideology is also central. Thomas and Pleck (1995) defined and described traditional masculine ideology using eight constructs: avoidance of femininity, negativity toward sexual minorities, self-reliance, aggression, dominance, non-relational sexuality, and restrictive emotionality. Levant (1992) proposed his own set of seven male gender norms, later turned into the Male Role Norms

Inventory (MRNI). These norms consist of non-relational attitudes, restrictive emotionality, homophobia, avoiding femininity, aggression, status seeking and self-reliance (Levant, 1992).

In 1986 O'Neil, in sync with Pleck's GRSP, developed a theoretical model now known as Gender Role Conflict, which considered specific domains in which gender role conflict is present and causes psychological consequences. O'Neil's work developed from a synthesis of the masculinity literature and built on Pleck's foundation of GRSP (O'Neil, 1986). O'Neil (1986) theorized that gender role conflict resulted in psychological stress and distress. Thus, O'Neil developed a scale to measure the constructs of his theory. While originally containing six factors, the final scale developed included four (O'Neil, 2015). The four factors: Success, Power, Competition (SPC), Restrictive Emotionality (RE), Restrictive Affectionate Behavior Between Men (RABBM), and Conflict Between Work and Family Relations (CBWFR) (O'Neil, 2015). O'Neil (2015) posited that conflict is present in both intrapersonal situations and interpersonal. Within interpersonal situations, conflict may occur toward another or towards self. O'Neil's theory further discusses gender behavior in terms of devaluations, restrictions and violations. Gender role restrictions, as the name suggestions, are limits placed on an individual's behavior in order to control them, so they don't step outside norms (O'Neil, 2015). Devaluation is also a negative consequence of placed on self or others when operating outside the norms of traditional masculine ideology. For example, a man might devalue himself for wanting a career deemed feminine, such as nursing (O'Neil, 2015). And lastly, violations occur when an individual is harmed because of the negative consequence of strict gender norms. Using our scenario from above, an example of violations would be the man getting physically or verbally abused for being a nurse.

Lastly, Mansfield, Addis, and Mahalik (2003) proposed a theory of gender role norms that has built on social and psychological theories. This theory, while differing in some respects, tends to also work in concert with social constructivism and social learning to examine the ways that masculine norms are developed and enforced. Mansfield et al. (2003) argued that dominate social groups decide the acceptable gender norms within a society and serve to reinforce those norms. This theoretical model also served as the impetus for Mahalik et al.'s (2003) proposed measure Conformity to Male Norms Inventory (CMNI). Mahalik et al. (2003) argued that dominant social groups determine the gender role norms and subsequent gender-specific expectations. These norms developed by Mahilik et al. (2003) were not meant to be all encompassing but rather core gender norms: Winning, Emotional Control, Risk-Taking, Violence, Dominance, Playboy, Self-Reliance, Primacy of Work, Power Over Women, Disdain for Homosexuals, and Pursuit of Status. While much of these norms align with, or fall within, categories proposed by Thomas and Pleck's (1995) traditional masculine ideology constructs, the authors' intent was to more broadly conceptualize male norms.

Mahalik et al. (2003) argued that social norms are communicated as rules, do's and don'ts, and positive and negative outcomes are associated with following or not following the rules. Furthermore, one's adherence to the rules and experience of these rules may be impacted by various individual identities, such as SES. These identities may in turn impact one's likelihood to conform or not conform to certain roles and masculinity traits. The model proposed by Mahalik et al. (2003) also supports the hegemonic masculinity concept proposed by Carrigan et al. (1985), insomuch that it recognizes the power associated with the group dictating norms. Of particular importance, Mahalik et al. (2003) contributed to masculinity theory by recognizing that conformity to male norms can both benefit men and negatively impact them. This cost or

benefit is very contextually dependent in terms of both the individual, environment, and interaction. Furthermore, Mahalik et al (2003) argued that specific norms hold more or less weight and vary by the individual's conformity to that particular norm.

In summation, masculinity theory, though originally developed through social and feminist theories, has been built on itself to develop an understanding that heavily draws from both psychology and sociology. While there are certainly arguments between theoretical understandings, there is also largely a general consensus among theorists and researchers. Masculinity is understood to be very strict and predisposed to causing psychological strain and distress, yet certain aspects of masculinity can also be a protective buffer or even a way of legitimizing privilege in social and political interactions. This research considers masculinity primarily from social norms perspectives and utilizes Mahalik et al.'s (2003) conceptualization of male norms. Furthermore, this research question acknowledges the social learning aspects of gendered health-behavior, which is also included in the aforementioned masculinity theories.

Masculinity

What is masculinity? Defining masculinity has been a struggle for many researchers as definitions tend to be simplistic and too categorical to capture the dynamic nature of gender. Furthermore, a masculine ideal is largely defined by the historical and cultural context of any particular point in time. For example, in American culture, traditional masculine ideology would include things such as distain for engaging in feminine behaviors, aggression, homophobia, stoicism, etc. (Pleck, 1981; Thomas & Pleck, 1995). However, this ideal can and is changing as social and cultural changes take place and as younger generations are studied (Anderson, 2018). Studies in the last decade have noted a strong presence of traditional masculine norms as well as

some areas of ambiguity. These studies largely highlight the contextually dependent nature of gender and identity.

Anderson (2002) studied the complexities of masculinity within athletic teams with openly gay athletes. The study was conducted using qualitative methods and sought to examine the extent of discrimination gay athletes experienced. Athletes discussed how they functioned in a setting that is both largely homophobic and serves to reinforce hegemonic masculinity and traditional masculine ideology. The authors found that athletes all discussed the need to act heterosexual to maintain their status on the team. Furthermore, the participants discussed the negotiation of competing identities by explaining that though homosexuality may not be seen as masculine, winning is considered masculine (Anderson, 2002). As such, if an athlete contributed to winning, the teammates were much more likely to accept them without any overt discrimination. This tendency was described and labeled by Anderson (2002) as "masculinity insurance" (p. 865). The idea of masculine insurance is that it serves as a buffer to make up for non-masculine tendencies or behaviors. In other words, if the men were acting as competitive and tough as other athletes, and contributed to winning, then they had enough insurance to make-up for the departure in their sexual preferences. And though Anderson's (2002) study is also limited, given the one-sided nature of the interviews (i.e., heterosexual athletes were not interviewed about their views), the findings address the complex nature of masculinity, which is both rigid and also adaptive.

Building on work by Anderson (2002), De Visser, Smith, and McDonnell (2009) conducted a qualitative study with the intent to examine some of the domains in which men can acquire "masculine capital" (p.1048). The authors were specifically interested in whether certain domains held more weight than others and how these departures from traditional masculine

ideology were negotiated. The authors identified two main themes throughout the interviews. Firstly, identities were discussed in a binary sense, either being masculine or feminine. In accord with Anderson's (2002) findings, homosexuality was equated to being feminine while heterosexuality was considered masculine. In exploring what constitutes as masculine, the authors looked at the nuances of masculinity.

De Visser et al., (2009) also found that while being powerful and aggressive was in accord with hegemonic masculinity, someone with a muscular physique who was engaging in modeling was seen as feminine. This was the second major theme, that a vain display of muscles for appearance-sake was decidedly less masculine. The participants made the distinction between looking muscular and being masculine and how the two are not mutually inclusive. As modeling is considered feminine, the act of modeling one's muscles was still seen as categorically feminine. However, the act of having muscles that had a function, or performance, such as playing a sport, would then put the man back into masculine territory. Masculinity was seen as not only having strength and power but being able to do something masculine with those physical attributes. De Visser et al. (2009) used this example to explore the idea of gathering masculine capital.

Specifically, De Visser et al. (2009) used several examples of famous people to have discussions surrounding masculine capital. For example, the authors used David Beckham, a famous athlete, as a point of discussion on masculinity. The fact that Beckham has modelled and tends to show a fashion sense was deemed somewhat feminine. Yet, in spite of this display of seemingly feminine behavior, the fact that Beckham has established himself as a world class athlete was seen to out-weigh these less-masculine tendencies. However, the authors also found that certain identities and behaviors held more or less weight. For example, De Visser et al.

(2009) found that an athlete's choice to abstain from drinking was seen as feminine. The participants stated that men are supposed to drink and those that abstain are considered weaker or more feminine. However, being a successful athlete would out-weigh the drinking abstinence given the capital acquired through athletic prowess. However, homosexuality was seen as taking a larger hit on masculine capital than either abstinence or modeling. This notion of masculine capital highlights the rigidity of traditional masculinity and the difficulty with which people navigate it.

Research by Prentice and Carranza (2002) explored the nature of gender roles, specifically which traits were positively and negatively valanced each for men and women. The authors sought to further understand what an American sample would deem appropriate traits for each gender. Using traits from Bem's Sex Inventory Scale, the authors asked participants to rate people based on what they thought American society as a whole would think. For example, they provided a set of traits and asked how desirable it was for a woman to possess those traits. They repeated the questionnaire for ratings on men and finally on people in general. In addition to desirable traits, participants were asked to rate how typical it was for each group (women, men, people in general) to possess a certain characteristic. The authors ended up with three groups with which they could statistically compare desired traits and perceived typical traits. Prentice and Carranza (2002) found that, as a whole, women were rated as having more social traits that were deemed desirable and fewer achievement traits. Men on the other hand had more achievement traits desired and fewer social traits. Additionally, these achievement-oriented traits that were ranked as highly desirable for men were ranked as less desirable for women. The typicality ratings and the desirable characteristic ratings were, in general, very consistent with traditional masculine and feminine roles. One takeaway from Prentice and Carranza's (2002)

research was the sheer number of positive social traits both attributed to, as typical, and rated as desirable for women. In addition to a large number of positive social traits rated as typical, there were also a larger number of negative traits attributed to women in comparison to men. Indeed, the traits rated as typical of men were nearly even in both the positively valanced items and the negatively valanced items. Lastly, Prentice and Carranza's (2002) research underscored the expectations of men in terms of being confident, self-reliant, assertive, and competitive, to name a few. The traits rated as desirable for men all reinforced hegemonic masculine ideals. These findings are even more compelling in light of the fact that the sample was comprised of undergraduates at Princeton University. In such a setting, one might expect a more liberal perspective on gender roles and traits.

Yet despite these findings, more current literature has also examined a shift for some populations in blending gendered lines for behavior. For example, a study by Anderson (2018) found that less rigid masculine domains were present in both younger generations and older generations to a certain extent. Furthermore, research by Robertson (2018) found significant changes in gendered attitudes following a seven-year longitudinal study in the UK. Roberston (2018) found that working-class young adult men considered doing housework and engaging in childcare practices to be normal. This finding is particularly note-worthy given that certain traits of traditional masculine ideology are often held more deeply by working-class men and/or those from lower socioeconomic backgrounds (DeVisser et al., 2009). However, while this finding is significant, it can by no means be generalized. As Connell and Messerschmidt (2005) discussed, masculinity must also be considered in geographical terms. In fact, while Anderson's (2018) research would suggest small but positive changes in relaxed norms, the majority of literature reports masculinity to consist of rigid and inconsistent norms that cause men stress (e.g., De

Visser et al., 2009; Prentice and Carranza, 2002). Furthermore, the relaxation of some masculinity norms does not indicate the relaxation of all, thus still creating gender role strain or conflict.

Men's Health & Help-Seeking

Men's health has been a subject of interest for decades (Holden, 1987; Verbrugge, 1979). Interest in men's health was increased in the 1970s and 1980s as researchers began looking into differences in life expectancy between males and females (Holden, 1987; Verbrugge, 1979). In an article by Holden (1987), the author succinctly surmised that, "maleness seems to carry an intrinsic risk (p. 158)." As bold as the author was in that statement, the supposition seems to hold true even today. Research has insufficiently addressed this health disparity. In fact, it was not until 1992 that men's health became an area of concern in public policy (Cameron & Bernardes, 1998). According to the Center for Disease Control (2017) men are at a higher risk of mortality, leading the statistics with high rates of death due to heart disease and cancer. Furthermore, according to the National Vital Statistics Reports (2016) men have an average life expectancy that is five years less than that of a woman. This decreased life expectancy has been largely attributed to lifestyle differences, such as higher likelihood of smoking by men and higher rates of heart disease (CDC, 2017; Pinkhasov et al., 2009). Additionally, many researchers have argued the higher rates of death due to heart disease could be due to men's propensity for foods high in cholesterol (Kiefer et al., 2005). However, given that men and women are nearly equal in their smoking rates and levels of obesity, these variables cannot account for the gap in life expectancies. Several biological-based theories exist, including men's lack of a spare "X" chromosome as impacting men's health (Pinkhasov et al., 2009, p. 470). As Holden (1987) pointed out, if women have the gene for muscular dystrophy, they can utilize their other X

chromosome while men, not having another, will assuredly get the disease. Yet, despite these variables, researchers cannot account for all of the variance and most agree that psychosocial factors are salient. For example, approximately one third of men deny having a primary care physician in comparison to one fifth of women (Heidelbaugh & Tortorello, 2012). Furthermore, research has found that men that would benefit from obesity treatment often choose not to seek help losing weight (Tol, Swinkels, De Bakker, Veenhof, & Seidell, 2014). Our look into men's health and help-seeking is through this widely held belief of psychosocial salience.

From a sociological perspective, men are statistically more likely to engage in risky behaviors (Courtney, 2000). Some of these risky behaviors include alcohol consumption, driving intoxicated, unsafe sexual practices, and failing to seek medical help (Courtney, 2000; Radimer & Rowan-Kenyon). One theory concerning men's engagement in risky and unhealthy behaviors is that it serves to separate them from women (O'Neil, 1987). O'Neil (1987) stated that men construct and define masculinity as being the opposite of femininity, as such, masculine behaviors are the opposite of feminine behaviors. For example, if it would be considered feminine to care for one's appearances and dress, then not caring about appearance or dress would be masculine. Or a man may choose to eat a burger and fries rather than a leaner and lower carbohydrate option. And in a healthcare context, engaging in preventative health care has been found to be considered inherently feminine (Farrimond, 2012; Lee & Frayn, 2008). In terms of seeking help, there have been a variety studies examining physical and mental help-seeking behaviors among men. Many studies have corroborated the finding that men utilize mental (e.g., Emslie, Ridge, Ziebland, & Hu, 2006; Mackenzie, Gekoski, & Knox, 2006) and physical (e.g. Vaidya, Partha, & Karmakar, 2012) healthcare services at a much lower rate than women. Studies have also concluded that masculinity is likely a salient factor in not seeking help, given

help-seeking is associated with femininity (Cameron & Bernardes, 1998). Men have, on average, much fewer diagnostic visits as well as primary care visits in comparison to women (Bertakis et al., 2000), and men are much less likely to have a regular primary care provider in comparison to women (Heidelbaugh & Tortorello, 2012). Given that men have much higher rates of mortality, many researchers have sought to examine the barriers to seeking help that men experience.

This research generally considers barriers in two distinct categories. The first category, attitudes, considers the way men's identity, values and attitudes all contribute to men seeking or not seeking help. Essentially, these pieces are the psychological components to the equation. The second category, structural barriers, would include barriers such as lack of health insurance, limited finances, and limited social support. The help-seeking literature is varying as it covers a range of both physical and mental health services and ailments. However, the act of seeking help, be it for cancer or depression, is relevant given the nature of health psychology and the mind-body connection. This section begins with men's attitudes toward health and help-seeking, as well as barriers.

A study by Oleski, Mota, Cox, & Sareen (2010) examined correlates of help-seeking and perceived barriers toward help-seeking. The sample consisted of more than 43,000 participants with an alcohol use disorder, 28% of whom met criteria for a lifetime alcohol use disorder. The authors discuss three primary groups that formed from the data. There were participants that would seek help, those that knew they should but chose not to seek help, and those that thought they did not require any help. The study found that attitudinal barriers (e.g., Didn't think anyone could help) were endorsed much more frequently than structural barriers (e.g., Couldn't arrange for childcare). The two most frequently endorsed attitudinal barriers reported by Oleski et al. (2010) were, that participants believed the problem would get better without intervention and

participants believed they should be able to handle things without outside intervention. The latter of these two received slightly more endorsement than the prior. Furthermore, these two attitudes were each endorsed by men more than twice as much as any other barriers. Yet, this finding is not particularly surprising as these attitudes could also be described in traditional masculine ideology terms as part of Self-Reliance. A limitation to this study is the fact that though the sample size was large, the authors oversampled men ages 18-24, which may have skewed the results.

The aforementioned study also highlights men's tendency to 'wait and see' or 'not overreact'. A small qualitative study by Jeffries and Grogan (2012) conducted one-on-one interviews with men regarding their self-referral to healthcare services. Men were found to subscribe to hegemonic masculinity ideals, or traditional masculine ideology. Furthermore, there were three themes present that support the findings by Oleski et al. (2010), specifically: men do not require medical intervention for things deemed to be minor, most medical issues will resolve themselves, and men are supposed to be strong and tough (Jeffries & Grogan, 2012). Jeffries and Grogan (2012) also found that participants repeatedly contrasted men's healthcare seeking to women's healthcare seeking. Women were seen as easily overreacting to minor ailments and quick to seek help for something that will resolve on its own. In essence, women were constructed as opposite of men (Jeffries & Grogan, 2012). While this is a simplistic view, to assume women cannot delay help-seeking or men cannot readily seek help, this is a popular assumption held by many. And although the study was small, this attitudinal finding has surfaced in other studies as well.

For example, a small qualitative study by Noone and Stevens (2008) examined men's attitudes on self-referral to healthcare services and found women to be described as over-users of

healthcare. Men described women as going for every little thing and also having no issue discussing ailments with friends and family. The men interviewed, in contrast, described men as unlikely to ask for help, not wanting to overreact to something small, and to generally wait and see if things get better. However, the author's note that men also described caring for health as being highly moral and desirable. Yet this paradox gets at the crux of the GRSP and stringent masculine identity, how can one be tough and self-reliant while also being quick to care for one's health? Noone and Stevens (2008) argue that the men interviewed navigated this dilemma by clarifying that while they may not always seek care, they seek care when it's truly needed. Thus, maintaining a masculine identity of self-reliance and stoicism while also caring for their health in a strictly non-feminine way.

The negotiating of masculine identity was also found in a qualitative study by O'Brien, Hunt, and Hart (2005). Similar to Noone and Stevens (2008), O'Brien et al. (2005) found men widely endorsed traditional masculine ideology and deemed regular use of healthcare services for trivial ailments as feminine. However, the authors also found instances where these attitudes conflicted. For example, the authors found that some participants regularly attended to ailments as their bodies were essential to their jobs (i.e., firefighters). Caring for health was considered by this subgroup of men as normative and essential to preserving the masculine identity of an able-bodied firefighter and tended to be a group mentality. The collective acceptance of these healthcare practices made it a social norm, thus almost stigmatizing those that neglected their health. Thus, the perception of the utility of one's body lends to another facet of masculinity. Furthermore, the collective acceptance of this viewpoint, allowed the men to eschew the label of being feminine. O'Brien et al. (2005) note the complexity of a masculine identity, with the

negotiation of masculine paradoxes, which has been further studied in men's health literature as well as masculinity literature.

Mahalik, Burns, & Syzdek (2007) explored the role of social norms in terms of masculinity and conformity to male norms specifically. Mahalik et al. (2007) speculated that perceived normative behaviors and conformity to male norms would predict the healthcare practices of participants. Furthermore, the authors hypothesized that perceptions of women's normative health-behaviors would have an inverse relationship with reported healthcare practices for men. In other words, if a participant deemed eating fruits and vegetables five times per day to be a normal practice of women, it would mean he was less likely to report he ate fruits and vegetables five times per day. This hypothesis comes from the literature about men defining masculinity in opposition to femininity (O'Neil, 1987). However, the authors found women's perceived normative behaviors were *not* predictive of men's behavior, contrary to their hypothesis. Yet perceived normative behaviors of men and conformity to male norms were predictive of a participant's reported healthcare behaviors (Mahalik et al., 2007).

In a two-part longitudinal study, Sieverding, Matterne, and Ciccarello (2010) examined social norms in the context of cancer health screening behavior in men. Specifically, the authors were interested in determining if perceived normative cancer screening health-behaviors in men would predict the cancer screening intention and behavior. In other words, the authors hypothesized that if men perceived other men to engage in health screening practices for cancer, they would be more likely to report intent and engage in the screening. Using a hierarchical multiple regression model, the authors analyzed the predictors and found that subjective norms (socially approved) predicted the *intention* of the participant to engage in cancer health screening. Furthermore, in the second part of the study, the authors found that subjective norms

also predicted the actual attendance of the participant in cancer screening behavior. As such, the Sieverding et al. (2010) concluded that social norms significantly impacted cancer health screening intention and behavior in men. This finding is significant in terms of understanding the motivation for men's engaging in help-seeking and healthcare behaviors.

Similarly, a more recent study by Mahalik and Backus Dagirmanjian (2018) examined the perspectives of healthcare practices in a sample of men with jobs entailing physical labor. As the authors' primary focus is how masculinity interplays with healthcare attitudes and practices, selecting a sample of men from a traditionally masculine employment sector was ideal. This study was very beneficial in terms of exploring the role work plays in the decision to seek healthcare, or not. The authors interviewed men concerning attitudes toward regular physical exams, medical help, and their perception of other people's healthcare practices. Similar to previous studies, women were considered to be regular users of healthcare. However, the participants noted women likely needed more care, in alignment with the traditional attitude that women are frailer than men.

Mahalik and Dagirmanjian (2018) also found that men discussed their peers' and colleagues' as unwilling to seek medical help for injuries or ailments. This was discussed as different from an annual exam. Indeed, the authors found work to be a central theme when discussing healthcare. While regular physical exams were seen as normal and routine, seeking help for an illness or injury was not considered routine. Participants discussed the need for medical care to need be severe enough that one could not work. If one could work, it was generally agreed upon that one did not need to seek medical help. Oddly, the men did not discuss fear of losing their job over a workplace injury. Instead, men discussed not wanting to seem frail or weak, and also not wanting to find out something bad. Additionally, men frequently cited

other men's behavior to illustrate what was or wasn't acceptable, in line with social norms theory and gender norms theory. Both these themes have been found in other studies examining psychological threats to help-seeking behavior in men.

Mahalik and Burns (2011) also examined health-behaviors in a sample of young men to determine if social norms and masculinity would predict engagement in behaviors known to reduce risk of heart disease. The authors utilized the Health Belief Model (HBM) as a way of examining health-behaviors. Furthermore, the authors extended the HBM, as many have done, to include other relevant variables. Specifically, per their hypotheses, the authors included measurements for conformity to traditional masculine norms and perceptions of normative heart health-behavior in addition to the traditional HBM constructs. The authors found several pertinent relationships. Firstly, Mahalik and Burns (2011) found that high conformity to traditional masculine norms predicted fewer positive heart health-behaviors. Furthermore, this relationship was greatly strengthened when the participant also reported barriers to undertaking the heart health-behaviors. Thus, the authors concluded that masculinity as impacting health-behaviors was understood in conjunction with other variables. Additionally, the authors did find that perception of positive heart health-behaviors being normative in men predicted the likelihood of engaging in heart healthy behaviors. Again, this finding is in line with social norms theory. Mahalik and Burns (2011) also noted that gender norms research will often have smaller effect sizes and can best be understood as either a mediating or moderating relationship. However, the authors still found that the extended model, including norms and gendered variables, helped explain the remaining variance outside of the traditional HBM model.

A study by Himmelstein and Sanchez (2016) examined social norms and masculinity in relation to health care behaviors in a sample of men and women. The authors argued that if social

norms and masculinity contribute to healthcare disparities, women were necessary to include in the group for comparison. The sample was large and diverse, including both university participants and community participants. Researchers described a framework of masculine contingencies of self-worth (CSW) that included two distinct categories, prescriptive and personal. *Prescriptive* norms refer to commonly accepted views on what someone of their gender *should* do. *Personal* norms refer to a person's personal belief system on what they should do. The authors hypothesized that women that held personal masculine CSW would report underutilization of preventative healthcare similar to men. The authors also examined social role beliefs regarding appropriate roles for men and women, to determine if these beliefs would predict the likelihood of engaging in preventative healthcare.

Himmelstein and Sanchez (2016) found that social role beliefs predicted both prescriptive and personal masculine CSW for men, but not women. Men were also more likely to subscribe to traditional social role beliefs than women. Additionally, personal masculine CSW predicted increased barriers to healthcare utilization for men. Yet although men tended to score higher on personal masculine CSW, the authors also found that when women held *personal* masculine CSW, they reported similar (though not equivalent) barriers to preventive health care utilization. Personal masculine CSW also significantly predicted minimization of healthcare problems and mistrust for physicians in both women and men. Taken together this would suggest that endorsing personal masculine CSW may indirectly contribute to underutilization of preventive healthcare. In other words, endorsement of these values relates to increased barriers, which then lessens the likelihood of seeking healthcare services. Furthermore, while more commonly endorsed by men, personal masculine CSW can impact women as well. This finding is in line

with most theoretical research highlighting the social construction of gender rather than an inherent biological set of traits.

A study by Snipes et al. (2015) reviewed men's healthcare attitudes in terms of understanding how men define health and what they see as incentives to or barriers of healthcare practices. Snipes et al. (2015) bring an interesting perspective to the conversation as the idea of what constitutes as *healthy* has been only indirectly discussed. In this qualitative research study, using a community sample of men, the authors found that men's idea of health, while consistent with research findings, was a somewhat less traditional definition of the word. These findings spanned four focus groups and sixteen individual interviews. Men's health was described as being able to provide for their families and make a living (Snipes et al., 2015). This value, while being a motivator for maintaining health, also acted as a barrier in terms of finding time to access care. Men navigated this discrepancy by downplaying the need for preventive health care (Springer & Mouzon, 2011). For example, while men found dentist appointments to be useful and important, they did not view routine medical appointments as such. For example, a routine dental cleaning provided a service that men found to be above and beyond what they would do at home. Yet a routine doctor's visit was seen as a waste of time and unnecessary. Men repeatedly reported that they did not get much out of a doctor's appointment. In short, the men did not feel they received new and useful information from a doctor's visit. Contrastingly, men also reported the potential discomfort of finding something wrong and the angst associated with getting results back.

Snipes et al. (2015) found that men preferred to wait and see, similar to other research findings (e.g., Noone & Stevens, 2008). In fact, the authors found that men cited wanting to be in

control of their healthcare while also feeling they have little control once they are speaking with a doctor. This attitude is in alignment with the hegemonic masculinity, in which one man may have more power other another, as well as traditional masculine ideas of self-reliance and appearing strong and capable. While men stated navigating the online system to find a doctor as complex, this structural barrier likely was not a huge contribution to their lack of healthcare seeking. The primary barrier found by Snipes et al. (2015) appeared to be attitudes toward what constitutes as health, the usefulness of preventive healthcare, and the conflict that routine healthcare created with men's work schedules. The subtheme present was the role of provider and how being a provider and focusing on work conflicted with taking time for preventative health care. This finding is consistent with other research showing the centrality of a work identity to masculinity (Griffith, Allen, & Gunter, 2011; Grunfeld, Drudge-Coates, Rixon, Eaton, & Cooper, 2013; Mahalik et al., 2007).

Griffith et al. (2011) examined African American men's attitudes toward health care seeking in a qualitative study involving 100 African American men. Similar to other research findings, participants discussed a general lack of interest in regular preventative healthcare. The was a general feeling that doctor's appointments were not useful unless a person was very sick, combined with a low-level fear of finding out something is wrong (Griffith et al., 2011). These findings have been reported in other studies as well, particularly the fear-led avoidance of things that could be wrong, and the view of doctor's as only being useful when one is sick, as a recurring theme in men's health attitudes (Ravenell, Whitaker, & Johnson, 2008). Participants also discussed disliking having a doctor order them to make lifestyle changes; this is consistent with masculine values of self-reliance and power (Griffith et al., 2011). The authors stated that doctor appointments, for most participants, were unpleasant and often resulted in the doctor

telling them they need to change their habits. Additionally, there was a general sense that doctors failed to describe how to make behavioral changes, and participants reported their spouses often stepped into that role to help (Griffith et al., 2011). Yet, there was also the presence of structural barriers in that statistically, many African American men do not have insurance or steady work. Participants discussed not having medical leave time so if they went to the doctor it would take money away from their families. This highlights the masculine value of being a provider and protector as well as the structural barrier of having limited access to services based on SES. However, in this same vein of prioritizing family, participants also discussed spouses as a significant form of support and facilitator of healthy behavioral changes.

A study by Leone, Rovito, Mullin, Muhammed, and Lee (2017) found masculinity was a significant predictor in the underutilization of men's healthcare. The authors used an integrative model to include the theory of normative contentment, hegemonic masculinity, and health-behaviors from the HBM. Leone et al. (2017) found that men's conformity to male norms and hegemonic masculinity largely predicted their engagement, or rather disengagement, in preventive healthcare services. Similar to the study by Griffith et al. (2011), Leone et al. (2017) found that men reported a lack of time to access healthcare. The other structural barrier noted by participants, which might be tangentially related to masculine norms if we consider this a result of self-reliance, was the lack of education regarding health risks. Men reported knowing how to access healthcare but did not seem to be aware of the health risks associated with not seeking regular preventative care (Leone et al., 2017). In this same vein, Leone et al. (2017) found that men also reported feeling like they didn't need to see a doctor unless it was something severe, which has been found in many other studies (Noone & Stevens, 2008; Oleski et al., 2010). Also, in concert with findings by Griffith et al. (2011), the men reported disliking the power dynamic

present with doctors and felt doctors did not treat them with respect (Leone et al., 2017). These findings would suggest that lack of preventative healthcare utilization is a combination of adherence to masculine norms, subscription to masculine ideology, and a few structural barriers.

These findings by Leone et al. (2017) are further supported by mental help-seeking literature (e.g., Hammer, Vogel, & Heimerdinger-Edwards, 2013; Pederson & Vogel, 2007). For example, a study by Hammer et al. (2013) found masculinity variables to act as a mediator in men's help-seeking behavior. The authors utilized a sample of nearly 5,000 undergraduate students and found that masculine norms were associated with self-stigma, resulting in negative attitudes toward mental health help-seeking. Furthermore, these findings held across, education and income groups, showing that regardless of these variables, conformity to masculine norms positively correlated with self-stigma and subsequently led to negative help-seeking attitudes.

Other findings regarding negative help-seeking attitudes include both men's perception of the health risk (i.e., perceived severity) and men's self-efficacy in engaging in help-seeking. For example, in a sample of more than 2,200 overweight men and men with obesity, Bunt, Merelle, Steenhuis, & Kroeze (2017) found perceived need for weight-loss help was predicted by both obesity and perceived poor health. In other words, men were more likely to believe they needed help losing weight if they were both men with obesity and believed their health to be poor. But believing one needs help and seeking help are two different processes. To this end, a study by Bowan and Walker (2010) examined predictors of men's healthcare utilization, specifically considering the role of general self-efficacy, and subscription to traditional masculinity. The authors found that traditional masculinity subscription moderated the perception of barriers to healthcare utilization (Bowan & Walker, 2010). Additionally, this relationship was also impacted by general self-efficacy, wherein higher levels of self-efficacy resulted in less perceived barriers

and lower levels resulted in greater perceived barriers. This is consistent with other literature, which finds that self-efficacy is often the greatest predictor of engagement in healthful behaviors (e.g., Orji et al., 2012). The authors concluded that incongruence with traditional masculinity and help-seeking likely facilitates the underutilization of services (Bowan & Walker, 2010).

Literature examining the relationship between specific masculinity variables and health behaviors is limited but shows a promising area of study (Levant, Wimer, Williams, Smalley, & Noronha, 2009; Wade, 2009). Levant, Wimer, and Williams (2011) conducted a study examining the relationship between the Health Behavior Inventory (HBI-20) and masculinity variables in a sample of college men. The authors measured masculinity variables using the CMNI, MRNI and the GRCS. The authors found that many masculinity variables were associated with negative health behaviors, but there were also variables associated with positive health behaviors. The authors found that the CMNI total scale scores were negatively correlated with HBI-20 scores, suggesting masculinity has a negative impact on health. However, the authors found that the CMNI Winning scale was correlated with avoidance of substance use, suggesting a positive impact on health behavior. In sum, the authors found that masculinity variables and health behaviors have a complicated relationship. Levant and Wimer (2014) replicated the Levant et al. (2011) study to re-examine the previous findings. The authors replication showed similar findings in that there was a relationship between certain health behaviors and masculinity scales and subscales. Concurring with Levant et al. (2011), the authors found that, depending on the scale and the health behavior, masculinity norms may predict positive or negative outcomes (Levant & Wimer, 2014). For example, risk-taking was associated with less health promotion behavior. However, subscale scores from the GRC-SF Success/Power/Competition (SPC) were

positively correlated with diet behaviors on the HBI-20, suggesting this masculinity aspect was a protective factor.

Building on previous findings (Levant & Wimer, 2014; Levant et al., 2011), Gerdes and Levant (2018) argued that while men's subscription to traditional masculine norms has been shown to be associated with negative health outcomes, researchers have failed to consider individual contribution of subscales in masculinity measures. For example, while previous studies have shown masculinity scores on the CMNI, MRNI, and GRC to negatively impact health-behavior, certain subscales have also illustrated positive impacts. In short, Gerdes and Levant (2018) argued that subscales often show strengths associated with masculine norms, not just weaknesses. As such, the authors conducted a study designed to examine the eleven subscales of the CMNI and their individual associations with health and well-being measures. The authors found that, in conjunction with other research findings, the CMNI subscales tended to coincide with negative health outcomes (Gerdes & Levant, 2018). However, there were some exceptions, which the authors argued warrant further exploration. For example, the Primacy of Work subscale of the CMNI showed a positive association with health-promotion behaviors. Other subscales showed a mix of positive and negative associations. The contextual factors are increasingly important as a masculinity variable may be positive in some instances and negative in others. The other conclusion to be drawn is that subscales should be considered in relation to masculinity and health-behaviors, as an overall score might fail to accurately describe the data.

Expanding the study by Gerdes and Levant (2018), a recent study by Salgado, Knowlton, and Johnson (2019) examined the relationship between men's health-risk or health-protective behaviors and conformity to masculine norms. In line with previous studies, the authors predicted that high endorsement of masculine norms would predict a lower likelihood of

engaging in health-protective behaviors. However, the authors were specifically seeking to determine which masculine variables, or subscales, impacted the lack of health-protective behaviors and/or increased health-risk behaviors. Two of their three hypotheses are particularly relevant to the current study. Firstly, the authors predicted that *proper use of health care resources* would be predicted by lower scores on risk-taking subscales of the CMNI. Secondly, the authors posited that *healthy diet* would not be predicted (either positively or negatively) by any of the masculine norm subscales. Salgado et al. (2019) found a positive correlation between engaging in health-risk behaviors and having high scores on Risk-taking, Self-Reliance, Power over Women, and Playboy subscales of the CMNI. Similarly, lower scores on Emotional Control (i.e., less endorsement of emotional control) were associated with health protective behavior. However, in contrast to their hypothesis, the authors did not find that lower risk-taking subscale scores correlated to *proper use of health care resources*. They did find that masculine norm subscales were not predictive of *healthy diet*. In short, the authors found that the CMNI-46 was able to predict both health-risk factors as well as health-protective factors, though scales tended to predict more negative health behaviors than positive (Salgado et al., 2019). The authors argue that future research should consider the overall scale as predictive as well as subscales and the individual variance contributing to either health-risk behaviors or health-protective behaviors. This research adds to the complexity of men's literature in that masculinity is at times protective, not just detrimental and also calls for future research to closely look at individual masculinity variables.

Other studies have found traditional masculine beliefs as related to lower likelihood of engaging in help-seeking or healthcare-seeking behavior. For example, a meta-analysis by Seidler, Dawes, Rice, Oliffe and Dhillon (2016) found that men had a lack of awareness

regarding depressive symptoms. The authors state that normative masculine beliefs, such as stoicism, result in less help-seeking behaviors and even contribute to unhealthy coping strategies. And a study by Davies et al., (2000) found men unlikely to seek help due to the pressure to appear invulnerable. These masculinity beliefs are often strongly engrained, making them difficult to combat in order to increase help-seeking and health-seeking. Thus, the authors suggest reframing health-seeking and help-seeking within the existing masculinity belief-system (Seidler et al., 2016). Namely, that help-seeking is a masculine strength, based on taking action rather than being passive. This suggestion is consistent with other literature that has found framing preventative healthcare in terms of action-taking or control-taking has been more productive at elucidating a positive outcome (Millar & Houska, 2007).

Body Image

Research has shown that people often engage in health behaviors for reasons other than improvement of health. For example, people may exercise or try and follow a specific diet not to improve wellness, but to reduce adipose body tissue and increase their overall attractiveness (Cash and Smolak, 2011; Orji et al., 2012). Given this tendency, it is important to understand the role of body image when discussing obesity and weight-loss. This is particularly important in consideration of a surgical approach to weight-loss, as appearance has often been ranked as a top consideration in the choice to undergo surgery (Brantley et al., 2014; Dixon, Dixon, & O'Brien, 2002; Fung et al., 2016; Sarwer, Thompson, & Cash, 2005).

Body-image dissatisfaction (BD) is a term used to describe negative body image schemas (Cash & Smolak, 2011). While body image dissatisfaction can encompass an array of concerns, a common concern is in regard to one's assessment of the person's appearance and the degree of

importance one attaches to that assessment (Cash & Smolak, 2011). BD from this perspective, has long been recognized in Westernized cultures, including the United States, as an issue — one that has been shown to negatively impact subjective quality of life (Mond et al., 2013; Paxton, Neumark-Sztainer, Hannan & Eisenberg, 2006). BD has been shown to negatively impact self-esteem, outcome expectations in various domains, and overall quality of life (Mond et al., 2013; Paxton et al., 2006). BD has also been shown to be linked with social norms and expectations concerning appearances, particularly involving body shape ideals. These ideals can be seen in many consumer products including ads, cartoons and children's toys, to name a few (Cash & Smolak, 2011). For women, body types tend to be prized for leanness along with other sexualized attributes, such as larger breasts. Men on the other hand are idealized for having muscular bodies (Kimmel & Mahalik, 2004). Additionally, Cash and Smolak (2011) pointed out the vastly different functions of children's toys, with male toys being action figures prized for both muscular looks and functionality while female toys are primarily valued for how they look. This highlights the gendered social messages regarding both the idealized look and purpose of each gender. While the etiology of BD is complex and beyond the scope of this section, suffice it to say that sociocultural standards and individual traits tend to lend a strong hand toward the development of BD.

Obesity-Related BD

For the purposes of this research, BD is primarily considered from a body fat/weight dissatisfaction perspective. Although, given the role of muscularity in men's body ideals, drive for muscularity is also considered. Given previous research findings, obesity-related BD is conceptualized as a possible motivating factor, toward engaging in weight-loss behavior. However, due to the distinct nature of BD as its own construct, this variable acts as its own

predictor in the proposed HBM model, *Appearance*, rather than falling within *Benefits*. This hypothesis is derived from WLS literature, though this literature also tends to be predominately on women (Brantley et al., 2014; Dixon, et al., 2002; Sarwer, et al., 2005).

While researchers have acknowledged body dissatisfaction (BD) in women for decades, it is only in the last decade that researchers have really begun to consider BD in men. Indeed, while BD has been found to have a strong sociocultural framework for women, these same frameworks often fail to explain men's experiences adequately (Cash & Smolak, 2011). Additionally, while research has shown that cisgendered women that subscribe to traditional gender norms are likely to hold more rigid, internalized ideals for themselves, there is no research on whether the same holds for men that conform to traditional gender norms (Cash & Smolak, 2011). Generally speaking, the understanding of BD in men, and specifically obesity-related BD in men, is significantly limited.

Since the 1990s, research has recognized the role of BD in populations with obesity (Sarwer et al., 2005). This population has been found to have significant levels of BD related to body fat (Sarwer et al., 2005; Rand & Macgregor, 1991). Studies have found that adults with obesity and BD also report lower levels of career aspirations, lower educational attainment, and lower expectations for their quality of life in comparison to non-obese adults (Mond et al., 2011; Paxton et al., 2006). In fact, a study by Rand and Macgregor (1991) found that post-WLS patients would rather be normal body weight and have a new disability than return to extreme obesity. The authors provided a list of disabilities including dyslexia, amputated leg, severe acne, heart disease and blindness (Rand & Macgregor, 1991). While a handful of patients chose extreme obesity over having a leg amputated or blindness, none chose obesity over the remaining

disabilities (Rand & Macgregor, 1991). This study highlights the severe stigma faced by individuals with obesity and extreme obesity (Sarwer & Polonsky, 2016).

Interestingly, a study by Dixon et al., (2002) found that as BMI increases, attitudes regarding appearance can change. For example, the authors found that a self-appraisal of appearance was negative for class II and class III men undergoing WLS (Dixon et al., 2002). Additionally, this negative self-appraisal was correlated to negative quality of life scores, meaning as quality of life decreased, so did one's appraisal of his or her appearance (Dixon et al., 2002). However, class III participants showed lower levels of appearance orientation in comparison to normal bodyweight samples. This means that at a very high BMI, participants rated that they were less concerned with how others viewed their appearances (Dixon et al., 2002). Although this may simply be a coping mechanism, self-appraisal may be a salient measure of obesity-related BD.

A study by Grilo, Masheb, Brody, Burke-Martindale and Rothschild (2005) measured BD in pre-surgical WLS patients using the Body Shape Questionnaire (BSQ). The BSQ, a self-report measure, measured BD and emotional distress regarding one's body shape. The authors found that BD was present in men, and it was significantly correlated with binge-eating habits. The authors also found that the BD was significantly greater, and self-esteem was significantly lower, in participants who reported binge-eating versus those who did not (Grilo et al., 2005). This finding was true regardless of BMI, which supports other literature that states, once present, BD does not proportionately increase with increased obesity (Barry, Grilo, & Masheb, 2003). This might suggest that men do, in fact, experience significant levels of BD.

Navigating Body Ideals

There is no one specific body ideal for men, rather it is a matter of which messages and ideals have been internalized (Tylka, 2011). Furthermore, BD is not a constant state but is rather often contextually dependent (Sarwer et al., 2005). The most common types of BD for men include a drive for muscularity and a drive for leanness, which can co-occur (Tylka, 2011). The types of male dissatisfaction typically include either a desire for increased muscle mass, a desire for decreased body fat, or a combination of both. This ideal is in stark contrast to either underweight, overweight, or non-muscular body types. Thus, male populations with obesity do not fit into these stringent social body ideals. Yet researchers have found the degree to which men undergo internalizing these ideals, may be impacted in part by masculinity (Cash & Smolak, 2011). For example, engaging in risk-taking and substance use, or having low self-esteem, mood dysfunction, or a perfectionist attitude have all been found to increase the likelihood of developing BD (Cash & Smolak, 2011). Alternately, men may use masculine norms as a buffer to experiencing BD (Monaghan, 2007).

Research by Monaghan and Hardey (2009) explored the ways men with obesity navigated the differences between the norms to which they subscribe and their actual identity, which may not fit with many of those norms. For example, there is a clear use of men's bodies in media to symbolize virility, power and sex appeal. As such, men living in large bodies without the muscle girth find themselves in opposition to this ideal. Obesity is seen by society as a weak condition, thus in contrast to the strong, powerful male ideal (Monaghan & Hardey, 2009). Furthermore, the adjective *weak* has largely been used to describe femininity rather than masculinity. Indeed, in a qualitative study by Monaghan and Malson (2013) men frequently pointed to women as being the victims of the media and social pressures to be thin. This concept

highlights the frailty associated with femininity, as women are seen as victims of social norms (Monaghan & Malson, 2013). Additionally, the men in this study repeatedly downplayed their own experiences of weight stigma by contrasting them to women's experiences (Monaghan & Malson, 2013).

Monaghan (2007) argued that the hegemonic focus on men's bodies as powerful may provide an opportunity for men to construct their identity as masculine bigness, rather than medicalized fatness. In other words, while women may be idealized as petite and weak, men are idealized as larger and more powerful. Essentially, this binary conceptualization may allow for men to reconcile their large body size as still being in opposition to femininity. Thus, though women cannot appear small and petite when in a larger body, men can still appear large and strong while in a large body (Monaghan, 2007). Research in this vein has repeatedly found that many men navigate the discrepancy between idealized male and their present reality by claiming some other aspect of masculinity (Emslie et al., 2006). While obesity may not be considered masculine in social discourse, being a big guy or large man, was associated with masculinity and being able to hold your own, so-to-speak (Monaghan, 2007; Monaghan et al., 2009; Monaghan & Malson, 2013).

Yet, these protective identities were not entirely consistent, as men that described themselves as big and masculine would also disclose feeling they looked pregnant; indeed, this abdomen insecurity was a recurring theme (Monaghan & Malson, 2013). Monaghan and Malson (2013) found that men ascribed bigness as masculine and acceptable with specific areas, such as the shoulders or back, whereas the abdomen was not an acceptable body part to be big. Thus, while men experience social pressures, some are also able to embrace aspects of masculinity that both protect them emotionally as well as affirm their identity. However, the authors found that

men repeatedly made gestures such as shrugging, to indicate any BD was a periphery issue rather than a focus for them (Monaghan & Malson, 2013). This rejecting of feelings of discomfort, associated with BD, is consistent with literature showing men's emotional restriction, and subsequent avoidance, as coping strategies (Mahalik et al., 2003; Thomas & Pleck, 1995; Mróz, Oliffe, & Davison, 2013). This finding suggests that masculine bigness, as a protective factor, is certainly not infallible and men may still experience BD. This may be especially true in populations that would qualify for WLS, as studies have found this population experiences BD (Sarwer et al., 2005; Grilo et al., 2005).

Given the limited nature of these studies as being qualitative, generalizations are not possible. However, an understanding of the negotiation of identities is useful in comprehending men's health-behaviors and experiences with obesity. Furthermore, the literature would support that further recognition of BD is warranted, especially in the context of WLS and men. In the current study, BD is expected to be a potential motivator for surgery, outside of the typical cluster of *Benefits*.

Concluding Thoughts

The reviewed literature emphasizes the complexity of masculinity and further supports the argument that masculinity plays a critical role in healthcare practices of men (e.g., Mróz et al., 2013). As stated by O'Neil (1987), one of the greatest measures of traditional masculinity is its contrasting position to femininity. This finding has been seen repeatedly in qualitative literature, wherein certain health-seeking and help-seeking behaviors, self-care, emotional expression, depression, and body image dissatisfaction are all seen as feminine issues (Johnson, Oliffe, Kelly, Galdas, & Ogrodniczuk, 2012; O'Brien, Hart, & Hunt, 2007). As such, it would be

labeled un-masculine, or even feminine, for a man to experience and or engage in any of the behaviors listed above. Indeed, the labeling of such behaviors as feminine was found throughout the literature. Health-specific literature also clearly displays the need for improved utilization of preventative healthcare services and medical interventions by men. In a world where eyesight can by corrected by laser in a 20-minute outpatient procedure, men should not be dying on average five years earlier than women. This disparity is, in part, a consequence of socially constructed gender identities. While masculinity tends to be considered a primarily privileged social identity, in this context it is potentially hazardous. Thus, this research seeks to understand masculinity variables in how they relate to men's perceived need for obesity intervention, consideration of WLS, and whether BD plays a role in consideration of WLS.

This research adds to the literature in several ways. Firstly, findings add to the literature on men's help-seeking behaviors, specifically within men's health psychology. Secondly, this study helps to explain some of the considerations men include in their decision to seek or not seek surgical weight-loss interventions. Or, given the research showing a lack of awareness regarding obesity risks, this study might also shed light on whether men consciously make the decision not to pursue weight-loss intervention. Along these same lines, this research adds to the WLS literature in an area that has been severely understudied. As the methodological approach is quantitative, and in a non-WLS sample, this study helps to explain why men may not be considering surgery in a way that a WLS-based sample cannot. And lastly, this study adds to our current understandings of how masculinity variables impact men's health, obesity attitudes, and BD.

METHODS

This research is conducted using quantitative methods. These methods were chosen in large part due to the paucity of quantitative research regarding men's attitudes toward WLS. The study design was modeled after several masculinity research studies, as well as health behavior studies using the health belief model. This combination was predicated on the nature of the research question which is framed as men's health psychology, rather than health or masculinity. While masculinity research has examined masculinity as predicting certain health protective and health risk behaviors, that research fails to explore a specific health belief or behavior. Indeed, only an initial relationship between masculinity and health behaviors or beliefs has been examined. This research seeks to build on those findings by utilizing a comprehensive health model and examining health beliefs specifically within the context of men's attitudes toward considering WLS.

In terms of examining men's health beliefs toward class II or III obesity and subsequent surgical interventions, a number of health models were considered. Yet upon examining the literature, the purpose of each model, and goal of the study, a modified health belief model (HBM) was chosen. While other health models have empirical evidence to support their use, this research is not examining whether men engage in a behavior, but rather their beliefs about a health-behavior. Furthermore, existing literature on diabetes, obesity and weight management have all successfully utilized the health belief model (e.g., Kartal & Ozsoy, 2007; Sapp & Jensen; Sapp & Weng, 2007). As previously discussed, research has shown that the health belief model should be modified and even tailored to the specific health belief being studied.

Model: Extended HBM for WLS

The HBM has be found to explain as much as 62% of the variance in outcome measure scores, which is a considerable amount in comparison to many health models (Dorrian et al., 2017). Yet, as stated by Dorrian et al. (2017), "[u]nexplained variance suggests that additional variables need to be assessed or that the HBM needs to be improved in some way (p. 49)." This conclusion is in concurrence with Carpenter's (2010) meta-analysis results as well as findings by Orji et al. (2012). Thus, a review of literature on the HBM leads the researcher to conclude that it is advisable to expand the model to increase its predictive value. As the HBM is used to predict a variety of health-behaviors, research in the domains of diet, nutrition, weight-loss, and obesity, are of particular importance to the current study.

The current study begins by using Rosenstock's (1988) proposed revised HBM as a baseline model. Specifically, the model for this research will include *Self-Efficacy* as research has consistently shown S*elf-Efficacy* to account for the largest amount of variance. Additionally, the variables *Benefits,* and *Barriers* have also been shown to be a significant contributor to predictive capabilities in the model. Regarding *Perceived Severity* and *Perceived Susceptibility*, studies support both items to be statistically significant, though at times small, in predicting health-change behaviors (Orji et al., 2012; Dedeli et al., 2011). Additionally, Zetu et al. (2014) found that while men and women showed no differences in *Perceived Susceptibility*, women showed significantly higher scores on *Perceived Severity* in oral healthcare behavior. As such, the predicative contribution of *Perceived Severity* was much higher in women. This may suggest that in comparison to men, women's perception of severity may contribute more to engaging in oral health-behavior. Of course, this could simply be a difference in perceptions of oral healthcare importance, which is notably less emergent then, for example, cancer. Furthermore,

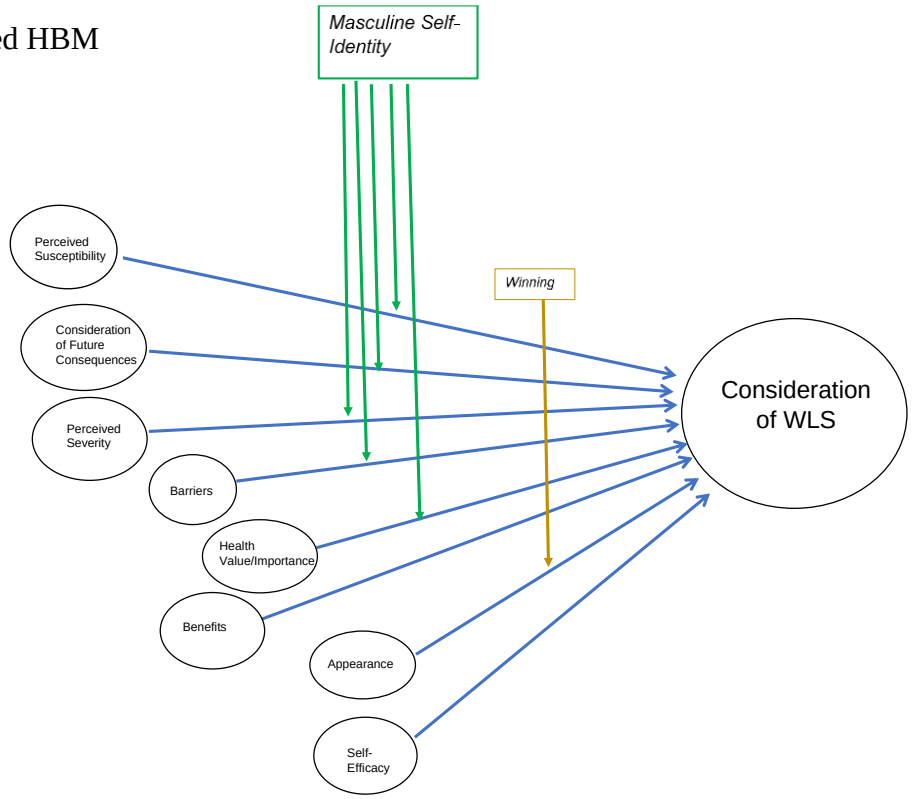
research has shown that combining *Severity* and S*usceptibility*, or even eliminating one or the other may produce inferior results (Abraham & Sheeran, 2005). The combining or elimination of one of these values violates the original expectancy-value framework that informed the model (Abraham & Sheeran, 2005). For this reason, both variables are retained in this proposed model. The one HBM variable excluded from the model is *Cues to Action*. *Cues to Action,* which was only loosely defined in the original HBM, has been found to be largely unnecessary in the model due to the vast range of cues available, particularly so in cross-sectional designs (Carpenter, 2010). One suggestion made by Abraham and Sheeran (2005) is *Cues to Action* can take many forms. In a health-behavior model, the *Cues to Action* could involve a provider suggestion and/or familial or peer comments regarding one's need to adopt a health behavior (Abraham & Sheeran, 2005). Thus, the variable is not well operationalized and may be more applicable in a clinical setting, where a cue may be present, than in a research setting (Rosenstock, 1974). For these reasons, *Cues to Action* is not included in the proposed model.

The extended model illustrated by Orji et al. (2012) made a compelling argument for including several variables to the HBM, finding the extension resulted in an increase from an R^2 of 40% in the revised HBM (i.e., including Self-Efficacy) to an R^2 of 78%, using the variables proposed in their extension. The variables included *Masculine Self-Identity*, *Appearance*, *Health Value & Importance,* and *Consideration of Future Consequences,* all of which have been incorporated into the current study's model. While *Appearance* showed a smaller contribution, it was still statistically significant at $p < .01$ (Orji et al., 2012). In addition, literature supports that men have body image concerns as well (e.g., Cash & Smolak, 2011), making this variable important given the specific nature of the study. The final proposed model includes additions by Orji et al. (2012) as well as most of the revised HBM (Figure 2.). This model most closely

resembles Orji et al.'s (2012) model, with the exclusion of *Cues to Action*. Additionally, *Masculine Self-Identity* is measured using CMNI-46 subscales: Risk-Taking, Self-Reliance, and Emotional Control. Additionally, the masculine subscale Winning is separately used (i.e., outside of the three masculine self-identity subscales) in relation to the *Appearance* predictor. This separation was devised based on recent literature by Salgado et al. (2019) that found correlations between Risk-Taking, Self-Reliance, and Emotional Control and health risk behaviors but not Winning and health risk behaviors. Additionally, Winning was selected to moderate Appearance due to studies that have illustrated that a competitive attitude is associated with concern for appearance (Kimmel & Mahalik, 2004). The colored box indicates the collective masculinity subscales and display the moderation relationship expected between our predictors and outcome variable (i.e., *Consideration of WLS*).

Figure 2

Proposed extended HBM



Measures

Each scale in the current study was selected to represent a variable in its entirety. For example, *Self-Efficacy* is measured using a weight-management specific scale. The variables of the proposed model are operationalized for use in the current study in the table below. Listed next to the definition column are the measure or measures associated with each variable.

Table 1

Predictor Variables	Definition	(Measure(s))
Perceived Severity	A person's evaluation of the social and health consequences associated with leaving the health condition untreated (Janz, 1984) An individual's assessment of the social and medical severity of their obesity.	Impact of Weight on Quality of Life-Lite (IWQOL-Lite), (Kolotkin, Crosby, Kosloski, & Williams, 2001).
Perceived Susceptibility	A person's subjective perception of the risk of contracting the health condition (Janz, 1984). An individual's assessment of the likelihood of being negatively impacted by their obesity (i.e., developing an obesity-related health condition such as diabetes).	The Health Belief Model Scale in Obesity (Dedeli et al., 2011)
Perceived Benefits	The extent to which one perceives beneficial outcomes will result from the health change (Abraham & Sheeran, 2005). The positive outcomes an individual believes will occur following obesity treatment (i.e., weight-loss).	The Health Belief Model Scale in Obesity (Dedeli et al., 2011)

Perceived Barriers	An individual's perceived impediments to change, such as cost, effort, unpleasantness, etc. (Janz, 1984). An individual's perception of difficulties and costs associated with engaging in obesity treatment (i.e., weight-loss).	The Health Belief Model Scale in Obesity (Dedeli et al., 2011)
Appearance	The level of concern one has regarding their appearance (Orji et al., 2012). The (positive or negative) attitudes a man has concerning his level of muscularity and his body fat.	Male Body Attitudes Scale (Tylka et al., 2005)
Health Value & Importance	Health Importance considers the value an individual attaches to the outcomes of engaging in the health-behavior (Orji et al., 2012). The level of importance an individual assigns towards maintaining a healthy body weight through proper nutrition and regular exercise.	The Health Belief Model Scale in Obesity (Dedeli et al., 2011)
Consideration of Future Consequences	"the extent to which people consider the potential distant outcomes of their current behavior and the extent to which they are influenced by these potential outcomes" (Strathman et al., 1994, p.742). The degree of concern an individual has for both immediate and distal consequences of their obesity.	Consideration of Future Consequences Scale (Joireman et al., 2012)

Self-Efficacy	A person's confidence in his or her ability to successful execute a particular action or behavior (Badura, 1997) The confidence one has in their ability to regulate their body weight through proper nutrition and physical activity.	Weight-Loss-Related Behavior Self-Efficacy Scales (Wilson et al., 2016)
Masculine Self-Identity	The level to which an individual identifies with, and conforms to, male gender norms (Mahalik et al., 2003).	Conformity to Male Role Norms Inventory-46 Subscales (Parent & Moradi, 2009)

Conformity to Male Role Norms Inventory-46 (CMNI-46): Masculine Self-Identity

Given findings by several studies (Gerdes & Levant, 2018; Levant et al., 2014; Salgado et al., 2019) regarding masculinity subscales and health-behaviors and attitudes, this research utilizes the Conformity to Male Role Norms Inventory (CMNI). As its name suggests, this measure will examine men's conformity to culturally dominant gender role norms. As this measure is dependent on cultural norms, there is some argument that it has lost some of its reliability over the years, as norms change (Kivisalu, King, Phillips, & O'Toole, 2015). However, reliability has been found to be acceptable, despite the decline, and the measure has also proved appropriate for use with diverse samples (Kivisalu et al., 2015). The original CMNI (e.g. Mahalik et al., 2003) was a 94-item measure, however Parent and Moradi (2009) developed a 46-item version which demonstrated excellent correlation with the original CMNI (Parent & Moradi, 2009). Reliability for the CMNI-46 subscales was reported by Parent and Moradi (2011) to range from .78 to .89. Additionally, subscales convergent validity ranges from .24 to .94 and discriminant validity range from -.03 to -.48 (Parent & Moradi, 2011). The CMNI-46 has been

discussed as a very useful measure when examining the impact of specific subscales, rather than using the CMNI-46 as a total score measure (Hammer, Heath, & Vogel, 2017).

The CMNI was designed to explore both positive and negative associations between masculinity conformity and subsequent behaviors and social interactions (Mahalik et al., 2003). Levant et al. (2014) found that the CMNI and the CMNI-46 both successfully predicted health-behaviors. Furthermore, Salgado et al. (2019) found the CMNI-46 to predict some health protective factors as well. Thus, the CMNI-46 is hypothesized by the researcher to provide the best measure for the research question. Specifically, subscales from the CMNI-46 make up the *Masculine Self-Identity* variable in the model. Given that this study hypothesizes that masculinity impacts *Consideration of WLS*, the *Masculine Self-Identity* was conceptualized as internalized gender role norms and subsequent conformity. Based on previous research findings (e.g., Levant & Wimer, 2014; Salgado et al., 2019), specific subscales were selected for their ability to predict and moderate health belief variables in the proposed extended HBM. The subscales selected were *Emotional Control*, *Self-Reliance*, *Risk-Taking,* and *Winning*. *Winning* was used in a separate analysis while *Emotional Control, Risk-Taking,* and *Self-Reliance* were averaged to create the *Masculine Self-Identity* variable. Reliability coefficients for these combined items was .72. This falls within an acceptable range for reliability. Additionally, the CMNI-22, which has a similar number of items, was found by Owen (2011) to have a Cronbach's alpha of .72 for a total score.

Male Body Attitudes Scale (MBAS): Appearance

In regard to our examination of BD on men's *Consideration of WLS*, the current study utilizes two of the three subscales from Tylka, Bergeron, and Schwartz's (2005) Male Body Attitudes Scale (MBAS). The MBAS is a measure used to assess men's attitudes toward

different aspects of body image that have been found in men's literature. The three subscales consist of body fat dissatisfaction, greater muscularity, and height dissatisfaction. The subscales used in the current study consist of body fat dissatisfaction (BF) and greater muscularity (M). An example of a question regarding muscularity is, "I think my chest should be broader". And an example of the BF measure is, "I feel satisfied with the definition in my abs (i.e., stomach muscles)." Both subscales have high internal consistency reliability as well as validity (Tylka et al., 2011). Dissatisfaction with muscularity, which is associated with the male norm drive for muscularity, is a 10-item subscale. The body fat dissatisfaction scale examines BD in relation to body fat and is an 8-item subscale. This measure is comprised of an average of all items. Thus, the average score of the items on these two subscales was taken to comprise the *Appearance* variable of our proposed modified HBM.

Impact of Weight on Quality of Life-Lite (IWQOL-Lite): Perceived Severity

Weight-loss motivation has been linked to a desire to improve health and overall functioning (Kolotkin, Binks, Crosby, Østbye, Gress & Adams, 2006). Given this correlation, *Perceived Severity* is also comprised of a quality of life measure specific to populations with obesity. The Impact of Weight on Quality of Life-Lite (IWQOL-Lite) questionnaire is a shortened version of the original 74-item Impact of Weight on Quality of Life measure (Kolotkin, Crosby, Kosloski, & Williams, 2001). The IWQOL-Lite is a psychometrically sound measure with five domain-specific scales. The IWQOL-Lite uses a series of statements requiring participants to rank their level of agreement with each statement on a scale of 1-5, with 1 being never true and 5 being always true. The IWQOL-Lite spans the domains of physical functioning, sexual life, work, and self-esteem (Kolotkin et al., 2001). An example statement from the physical domain is "Because of my weight I have trouble tying my shoes" (Kolotkin, 2016). And

an example of a question, from the Self-Esteem domain, is “Because of my weight I avoid looking in mirrors or seeing myself in photographs.”

A confirmatory factor analysis found the scales to have excellent reliability reported at Cronbach’s alpha of .90 to .94, with the total survey having a reliability of .96 (Kolotkin et al., 2001). This measure has also been cross-validated (Kolotkin et al., 2001). This measure is designed to capture attitudes surrounding weight-related impact on various domains of everyday life.

This measure is calculated using several steps to translate IWQOL-Lite raw scores to a 0 (worst) to 100 (best) score, per the author’s instructions. Lower scores mean endorsement of negative effects of obesity while higher scores mean less endorsement of negative effects.

The Health Belief Model Scale in Obesity (HBMSO): Perceived Susceptibility, Health Importance/Value, Barriers, and Benefits

While other literature on health and masculinity has utilized the HBI-20, authors have reported less than acceptable internal consistency estimates for many subscales (Levant & Wimer, 2014; Salgado et al., 2019). Additionally, the HBI-20 does not specifically address beliefs or behaviors related to obesity or weight-loss, but rather assess engagement in health risk and health protection behaviors. Furthermore, as the current study is conceptualized with in a Health Beliefs Model, an HBM questionnaire provided a better theoretical fit. The questionnaire selected, The Health Belief Model Scale in Obesity (HBMSO) was designed and validated by Dedeli, Fadiloglu, and Kalimeler (2011), measuring obesity attitudes in alignment with HBM constructs. The measure captures the following HBM constructs: *Perceived Susceptibility, Health Importance/Value, Barriers, Benefits,* and *Perceived Severity*. Four of the five subscales were included in the current study, with the *Perceived Severity* subscale excluded. As previously

stated, the measure was designed for capturing obesity-related attitudes. For example, the following item pertains to the variable *Benefits*: "Changing my lifestyle to reach the weight I aim will be good for me" (Dedeli et al., 2011). The HBMSO's *Perceived Susceptibility* subscale assesses an individual's attitudes toward the severity of obesity. An example item from this subscale is, 'There is a high risk of developing health problems due to obesity in any period of my life' (Dedeli et al., 2011).

The subscale construct validity for *Perceived Severity* was reported at Cronbach's alpha value of .74 and reliability at .79 (Dedeli et al., 2011). Dedeli et al. (2011) reported an internal consistency reliability of Cronbach's alpha of .80 and a test-retest reliability scores ranging from the lowest at $r>0.60$ ($p<0.00$), to $r=.80$, depending on the specific domain. Given these findings, the measure was deemed for reliable and appropriate for the current study.

The items used a 5-point Likert scale to capture level of agreement with each statement. Each subscale was scored by calculating the average of that respective subscale's items. Higher scores indicate greater endorsement. For example, a high score for *Barriers* indicates a greater number of identified barriers while a high score in *Benefits* indicates a greater number of perceived benefits.

Consideration of Future Consequences Scale (CFC): Consideration of Future Consequences

Stratham, Gleicher, Boninger, and Edwards (1994) developed and validated a measure designed to capture the extent to which people consider future consequences of potential behaviors. Stratham et al. (1994) and argued for the CFC to be used in a variety of context, including health-behavior research. In 2012, Joireman, Shaffer, Balliet, and Strathman, expanded the measure to include two more items, thereby increasing the scale's reliability in measuring immediate and future consequences. The authors reported the 14-item measure increasing the

original 12-item measures reliability. Joireman et al. (2012) reported the two new subscales as having Cronbach's αs of .80 and .84, demonstrating high reliability. Each item was rated using a 5-point Likert scale. The measure is scored by taking an average of the 14 items.

Joireman et al. (2012) applied the measure to people's attitudes toward heathy eating and exercise behaviors, which aligns with the current studies objectives. An example item from this scale measuring immediate consequences is: "I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level." The participant is asked to score

The CFC helps to parse out an individual's consideration of both immediate and future consequences, which may or may not align. This scale is particularly salient given the current studies aim to assess attitudes toward an efficacious health intervention.

Weight-Loss-Related Behavior Self-Efficacy Scales: Self-Efficacy

Along with field standards specifying self-efficacy as domain-specific rather than general, self-efficacy was measured in a weight management-specific domain. Wilson et al. (2016) developed a measure incorporating three specific behavioral aspects of weight management: physical activity, healthy eating, and weight-loss. The authors reported the measure as valid in measuring self-efficacy in the domain of weight-management behaviors.

The authors decision to measure three specific aspects of weight management behaviors allows for a more robust understanding of self-efficacy in weight management (Wilson et al., 2016). While a person may be able to walk daily, they might struggle with heating healthful, or vice versa. For each of the three domains, the measure asks four situationally specific sub-questions with a Likert rating for each item from 0-100%. An example of an item from the

healthy eating domain is the overarching question, "How confident are you that you can stick to eating healthful foods"…, followed by the situationally specific subquestion, "…even if you need a long time to develop the necessary routines." A total score is then calculated by an average percentage across all items. Higher scores indicate greater self-effiacy.

Outcome Measure: Consideration of WLS

This outcome measure, in terms of theoretical underpinnings, best represents men's help-seeking in a WLS context. As such, our model hopes to explain the variables that contribute either consider engage or not engage in this specific type of help-seeking behavior. Given the specificity of the research question, there was no existing measure concerning consideration of WLS. However, research regarding WLS preparation and screening was reviewed, including questions designed to measure receptivity. The current study integrated the findings (e.g., Fung et al., 2016) to develop an outcome measure that would capture the facets of WLS rather than rely on a binary outcome of yes/no. The measure was developed to reflect various stages of change and receptivity, incorporating the transtheoretical model. An example from the measure is "I am not considering WLS at this time." The measure is comprised of five items with statements capturing various levels of receptivity. Each item used a Likert scale from 1-5. The measure was then scored by taking an average across the five items with greater numbers indicating greater levels of receptivity toward WLS.

Aims, Predictions, & Hypotheses

This research considers men's attitudes toward *Consideration of WLS*. More specifically, the role of masculinity and *Masculine Self-Identity* in men's *Consideration of WLS* is examined. This is examined in terms of *Masculine Self-Identity* added to the model as a predictor and tested as a moderator as well. Given the number of variables in health beliefs, there are a number of

predicted relationships we might theoretically expect to find. The most salient predicted relationships are discussed in terms of hypotheses and supporting evidence for the predictions.

Firstly, one aim considers the utility of the proposed model, in terms of predicting *Consideration of WLS*. While different HBM models have been tested, the literature also supports the need to tailor the model for specific domains. As this model has not been used to examine attitudes regarding WLS, the application of this model is novel and might inform future WLS research.

Research Question 1: Does the proposed extended HBM predict men's consideration of WLS at a statistically significant level?

Literature would support that men are less likely to engage in help-seeking and subsequently unlikely to consider WLS. Furthermore, men may be less likely to perceive themselves as susceptible to obesity-related health risks and regardless of this perception, men that have high conformity to masculine norms may still be unlikely to consider surgery. This rationale, along with findings by Orji et al. (2012), supports our expectation that this extended model will explain greater than or equal to 21% in the variance men's *Consideration of WLS*.

Hypothesis 1a: The proposed extended HBM predicts men's *Consideration of WLS* at a statistically significant level.

Hypothesis 1b: The proposed extended HBM's predictive capability is increased with the inclusion of masculinity self-identity as a moderator.

Research Question 2: Does a *Masculine Self-Identity* moderate the relationship between health beliefs and *Consideration of WLS*?

Literature shows the complexity of masculinity and supports the argument that masculinity plays a critical role in healthcare practices of men (e.g., Mróz et al., 2013). Thus, our hypotheses examine how masculinity might moderate the relationships in the model.

Hypothesis 2a: Masculine *Self-Identity* will moderate the relationship between *Perceived Susceptibility* and *Consideration of WLS*. Specifically, when scores on Risk-Taking, Self-Reliance, Emotional Control are high, relationship from *Perceived Susceptibility* to *Consideration of WLS* would be weakened.

Hypothesis 2b: Masculine *Self-Identity* will moderate the relationship between *Perceived Severity* and *Consideration of WLS*. Specifically, when scores on Risk-Taking, Self-Reliance, Emotional Control are high, a relationship from *Perceived Severity* to *Consideration of WLS* would be weakened. Alternately, low scores on Emotional Control, Risk-Taking, and Self-Reliance would correlate with higher endorsement of *Perceived Severity* and a stronger positive relationship with *Consideration of WLS.*

Hypothesis 2c: *Masculine Self-Identity* will moderate the relationship between *Barriers* and *consideration of WLS.* Specifically, when scores on Risk-Taking, Self-Reliance, Emotional Control are high, the relationship between *Barriers* and *Consideration of WLS* would be weakened. In other words, we would anticipate that men that endorse a stronger masculine identity are also likely to endorse more *Barriers,* and we anticipate these men to be less likely to consider surgery, regardless of endorsing more barriers.

Hypothesis 2d: *Masculine Self-Identity*, as measured by subscales Emotional Control, Risk-Taking, and Self-Reliance will moderate the relationship between *Health Value & Importance* and *Consideration of WLS*. Specifically, higher scores on Emotional Control, Risk-Taking, and

Self-Reliance will be correlated with lower endorsement of *Health Value & Importance*, thereby strengthening an inverse relationship between *Health Value & Importance* and *Consideration of WLS*. Alternately, low scores on Emotional Control, Risk-Taking, and Self-Reliance would correlate with higher endorsement of *Health Value & Importance* and a weakened relationship with *Consideration of WLS*.

Hypothesis 2e: *Masculine Self-Identity* will moderate the relationship between *Consideration of Future Consequences* and *Consideration of WLS*. Specifically, low scores on Risk-Taking, Self-Reliance, and Emotional Control may also result in greater *Consideration of Future Consequences* and a stronger relationship with *Consideration of WLS*. High scores on Risk-Taking, Self-Reliance, and Emotional Control would result in a weakened positive relationship between *Future Consequences* and *Consideration of WLS.*

These hypotheses are developed based on the supposition that masculinity characteristics, as captured in the *Masculine Self-Identity* variable, comprised of Risk-Taking, Self-Reliance, and Emotional Control, will be salient in the decision-making process concerning *Consideration of WLS*. This is supported by the literature regarding men's lack preventive health care utilization (Springer & Mouzon, 2011; Salgado et al., 2019). Additionally, hypotheses are also supported based on the results from several studies on masculinity and health behaviors (Gerdes & Levant, 2018; Levant & Wimer, 2014; Salgado et al., 2019). As previously discussed, the authors found CMNI-46 subscales to inversely correlate with health-protective behaviors. While the items are not entirely the same, we hypothesize a similar relationship will emerge.

Exploratory Aim: Do negative body image attitudes predict the likelihood of men considering WLS?

An exploratory aim considers the role of body image dissatisfaction as BD has been shown to play a significant role in women's pursuit of WLS (Pearl et al., 2019). This data is important for understanding whether BD plays a role in men's consideration of surgery. Literature on BD shows that both men and women are negatively affected (Cash & Smolak, 2012). Given this finding, and women's report of BD being a top motivator for WLS, there is reason to predict that men with BD might be motivated to consider WLS (Pearl et al., 2019). The CMNI's Winning scale is meant to capture those competitive attitudes found in masculine norms. The supposition here, which has been shown in previous studies, is that a competitive attitude is likely to be associated with concern for appearance (Kimmel & Mahalik, 2004). This is supported by literature showing neuroticism as highly correlated to body dissatisfaction, with neuroticism being a Big Five personality trait that encompasses a competitive nature (Lahortiga-Ramos et al., 2018; Martin & Racine, 2017).

Hypothesis 3a: Men that indicate higher levels of body dissatisfaction will be more likely to consider WLS as an obesity treatment.

Hypothesis 3b: Masculinity subscale Winning will moderate the relationship between *Appearance* and *Consideration of WLS*. Specifically, men that have high Winning scale scores will also have scores that indicate BD on the *Appearance* scale. In turn, high *Appearance* scale scores and high Winning scale scores will strengthen the positive relationship between *Appearance* and *Consideration of WLS.*

Procedures

Recruitment was through Amazon's Mechanical Turk (MTurk). MTurk is crowd work platform that allows for recruitment of participants and subsequent data collection Buhrmester et

al., 2011). MTurk has been found to produce diverse samples and reliable data (Buhrmester et al., 2011). A link was posted on MTurk along with an informed consent form (see Appendix I). Given the complexity of the research question, the recruitment plan was for a minimum of 350-450 participants that met criteria for inclusion into the study.

Data was collected using an online Qualtrics survey, licensed for use by the University of Wisconsin-Milwaukee. Validity checks were embedded within the survey to ensure quality data is gathered. An example of a validity check is, "For this question, please select the response 'other'." Participants that do not correctly answer two or more validity checks were removed from further participation in the survey and their data will not be used.

Sample

Inclusion for the study was somewhat limited given specific nature of the research question. Participants were required to be over the age of 18 and United States residents or citizens, and the study will specifically recruit those that identify as men. The study did not specify biology, but rather was interested in those participants that identify as male. As the study is concerned with *Consideration of WLS*, men that either fully meet surgery criteria or partially meet criteria (i.e., BMI of 35 or higher) were included. The choice to include partial requirements met is due to the fact that men with Class II obesity would also need an accompanying obesity-related co-morbid condition (ABMS, 2019). Given that many obesity-related co-morbidities go years undiagnosed (Borgerass et al., 2018), and the fact that age will likely impact the presence of a co-morbidity (Borgerass et al., 2018), BMI was the most salient feature. A BMI of greater than or equal to 35 is required, per ABMS (2019) criteria. As previously stated, individuals with BMIs 35-39.9 must have obesity-related comorbidities to be

considered for WLS (ABMS, 2019; Jensen et al., 2013). Additionally, the need for surgery is determined by a physician based on the goal of alleviating comorbidities (Jensen et al., 2013). However, given the inability to have a physician assess the significance of comorbidities, this data was not used to filter out potential participants. Instead, the sample request from MTurk included a weight minimum as well as height maximum in order to calculate a minimum BMI of 35 for all participants. The researcher recognizes the possibility of losing participants that might otherwise qualify should their BMI be lower but they have significant comorbidities. While this method was not without flaw, the tools available through MTurk limit the specificity needed for the sample.

Amazon's Mechanical Turk survey-takers typically receive $.25 per survey, or thereabout for similar, if not lengthier, surveys. Given this cost, the length of the survey, and the desired number of participants, the researcher initially compensated each survey-taker $.25 and then increased the amount to $.50 per survey in order to generate more participation. Each participant was first screened for demographics, reporting their height and weight. Those who reported a vastly different height and weight following the demographic screener had their responses excluded from the dataset.

Data Analyses

To examine the relationship between masculine identity and obesity-related health-behaviors, this research utilized a Hierarchical Regression analysis. Hierarchical Regression is an analysis type where independent variables (IVs) are entered in a cumulative fashion in a sequence, ideally informed by theory (Cohen, Cohen, West, & Aiken, 2003). In a hierarchical regression, there is a set of regression analyses each including an additional variable or set of

variables (Cohen et al., 2003). This method allowed the researcher to test the model, determine the salience of the predictor variables, and test moderator variables in the *Consideration of WLS* (Dawson, 2014).

Figure 3

Model without interactions

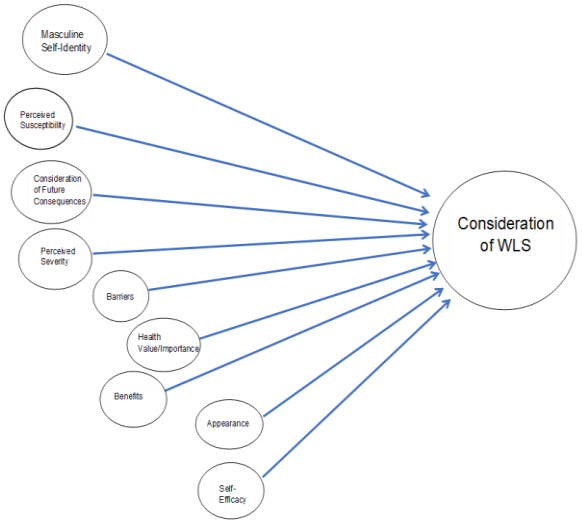
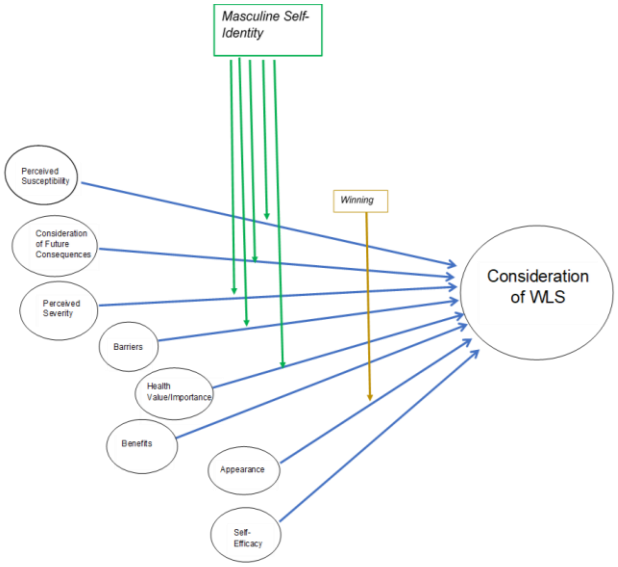


Figure 4

Model with interactions



Two power analyses were conducted given the two separate 'sets' of predictors tested. The first power analysis was for the initial model (without interactions). This test was to determine the sample size needed to test our predictors without the interactions. The power analyses were both conducted using a software called G*Power to determine the minimum sample size requirement for the analyses (Faul, Erfelder, Bucnhner, & Lang, 2014). The power analysis for set one was run using a medium effect size .15, a total of 10 variables at an alpha level of .05. The sample size provided by the software showed a minimum sample size of 172.

A second power analysis was conducted to determine the necessary sample size to test the interaction set. The power analysis was run using an effect size .07. A .07 effect size was

chosen based on literature suggesting an interaction for this variable being between small and medium effect size at approximately .10 (Orji et al., 2012). The number of predictors was set at 16 (10 variables, with 6 interaction variables) testing the 6 interaction variables, at an alpha level of .05. The sample size for these parameters was a minimum of 305. Given these findings, our proposed sample size of 350-450 was deemed to be sufficient. Once the data was collected, several tests were conducted to ensure the sample size met the assumptions required in regression.

Procedures outlined by Frazier, Tix, & Barron (2004) were followed in order to test our hypotheses. The first step was mean centering all the variables, and this step is done to reduce any collinearity issues (Cohen et al., 2003; Frazier et al., 2004). The second step, in order to test hypotheses 2a-e and 3a, was to create product terms for the hypothesized moderation relationships (i.e., creating new variables for the interaction) (Frazier et al., 2003). For example, IV (*Predicted Susceptibility*) + S (*Masculine Self-Identity*) + IV x S= DV and IV (*Predicted Susceptibility*) + 0 + IV x 0= DV (*Consideration of WLS*). In the formula above, our new product term IV x S would be *Predicted Susceptibility* multiplied by *Masculine Self-Identity*. The third step then involved using statistical software to add variables into a hierarchical regression equation. Variables were added as *sets*, allowing the researcher to test the partial model as shown in Figure 4 and the full model as shown in Figure 5.

The first set of data entered was the mean-centered predictors and moderators (*Winning* & *Masculine Self-Identity*) into the regression equation. The second set of data added all the interaction terms created (from step 2). For example, in addition to *Perceived Severity, Perceived Susceptibility, Barriers, Benefits, Self-Efficacy, Consideration of Future Consequence, Health Value & Importance, Appearance,* and *Masculine Self-Identity*, it would also include *Predicted*

Susceptibility x *Masculine Self-Identity*, *Predicted Severity* x *Masculine Self-Identity* and so on and so forth. The third set included the interaction between *Appearance* and *Winning*. Results were interpreted by examining the effects of both the predictors and moderator variables (i.e., main effects and interaction effects) and by testing the significance of these effects (Cohen et al., 2003; Frazier et al., 2004). Interpretations were made by examining R^2, semi-partial correlations, and F-tests (Dawson, 2014; Frazier et al., 2004).

Results

Survey data was collected from 779 participants and 504 surveys were kept for use in the analyses. Surveys that were rejected from MTurk were filtered from the dataset and surveys that were less than 95% complete were removed. SAS software and Excel were used to complete all analyses. SAS software automatically corrected the analyses for missing data points. Summary statistics are listed in the table below.

Table 2

Variable	Mean	Median
Age	35.7	35
Body Mass Index	42	39.4
Income	-	$30,000-$49,999 (n=125)
	n	%
Familiar with WLS	418	83
Discussed WLS with Physician	141	27
1 or more Co-Morbid Conditions	280	55

Using SAS software, the data was reviewed to ensure the sample met the assumptions required in regression. Assumptions would include normality, homogeneity and linearity. These assumptions were tested by review of residual plots shown below. The plots indicated there were no violations of the assumptions. Two values were identified as outliers by Cook's D plot, more than triple the mean value, and thus were removed from the dataset. Fit diagnostics below show the fit with removal of the two observations.

Following best practice, the analysis was preceded by mean-centering all variables. This allows us to make a more meaningful interpretation given that in many situations there will not be a value of 0. This also provides an added measure of protection against any potential multicollinearity issues. And this does not change our overall R^2 because we are simply changing the scale of the predictor, not the actual relationship. Below are the means for each of our variables. The mean-centered variable was created by writing a code that subtracts the mean from each value, creating a new term to be used in the analysis. The output created from the code showing new, mean-centered mean values is also shown below.

Table 3

Variable	M	SD
Perceived Severity	86.4	27.5
Perceived Susceptibility	3.74	0.77
Perceived Benefits	4.00	0.72
Perceived Barriers	2.61	0.73
Appearance	3.39	0.65
Health Value & Importance	2.97	0.75
Consideration of Future Consequences	3.11	12.6
Self-Efficacy	58.7	21.1

Masculine Self-Identity	14.0	3.95
Consideration of WLS	3.36	1.62

Multicollinearity was then assessed by reviewing Variance Inflation (VIF) output. Of the predictor variables, no concerns for multicollinearity were found with all VIF scores under 2.2. When the interaction terms were added, the VIF values were all lower than 2, indicating there were no concerns of multicollinearity.

Table 4

Variable	VIF
Perceived Severity	1.94
Perceived Susceptibility	1.90
Perceived Benefits	1.80
Perceived Barriers	1.72
Appearance	2.20
Health Value & Importance	1.61
Consideration of Future Consequences	1.35
Self-Efficacy	1.61
Perceived Severity x Masculine Self-Identity	1.25
Perceived Susceptibility x Masculine Self-Identity	1.75
Perceived Barriers x Masculine Self-Identity	1.69
Health Value & Importance x Masculine Self-Identity	1.19
Consideration of Future Consequences x Masculine Self-Identity	1.35

The first set of data entered were the mean-centered predictors and moderators (*Winning & Self-Identity*) into the regression equation. This test is to obtain the R^2 without the interaction terms in order to determine what contribution the interaction terms might make to our overall R^2.

This can then be re-tested once the full model is obtained by reviewing the unique contribution of each of our predictor variables. Our initial test (partial model) showed an R^2 of .2717 and an F-test of 18.01, which was significant at a p value of <.0001. This means, the above predictors explain a statistically significant portion of the variability in outcomes on our *Consideration of WLS* measure. Our predictors collaboratively explain about 28% of the variance. There was a total of 494 observations used by SAS in the analysis. The results below show our predictors and the corresponding T-Values and P-Values and contributions to the model. The squared semi-partial correlation (rab.c) shown below is type II. As this analysis is evaluating *sets* of predictors, we were concerned what the changes are from set to set, or model to model, and not the order the individual predictors were entered.

Next, the second set of variables were entered, testing our interaction terms that represent *Masculine Self-Identity*. The F test, which tested the interaction terms, had 5 degrees of freedom and an F-value of 5.05 that was statistically significant at a p value of 0.000. This indicates that our interaction terms collectively have a statistically significant impact on our model. The variables below show contribution after controlling for the first set tested. Or, in other words, the contribution of these variables above and beyond that which was found in the first set.

Table 5

Hierarchical Regression

Variable	t	p	rab.c	95% CI		SE *B*	R^2	ΔR^2
				LL	*UL*			
Step 1								
Perceived Severity	9.12***	<.000	.125	.022	.035	.003	.275	
Perceived Susceptibility	2.04*	.042	.006	.0080	.477	.119		

Perceived Benefits	-2.47**	.014	.009	-.518	-.058	.117		
Perceived Barriers	-1.93	.053	.005	-.426	.003	.109		
Appearance	-1.29	.196	.002	-.473	.097	.145		
Health Value	1.57	.117	.003	-.041	.372	.105		
Future Consequences	-2.73**	.006	.011	-.758	-.123	.161		
Self-Efficacy	-.87	.382	.001	-.010	.004	.003		

Variable	t	p	rab. c	95% CI		SE *B*	R^2	ΔR^2
				LL	*UL*			
Step 2								
Perceived Severity	9.20***	<.000	.123	.022	.035	.003	.309	.034***
Perceived Susceptibility	2.24*	.025	.007	.032	.496	.118		
Perceived Benefits	-2.33*	.020	.007	-.498	.042	.116		
Perceived Barriers	-0.99	.321	.001	-.329	.108	.111		
Appearance	-1.40	.161	.002	-.486	.081	.144		
Health Value	1.37	.172	.002	-.063	.350	.105		
Future Consequences	-2.10*	.035	.006	-.654	.022	.039		
Self-Efficacy	-.98	.326	.001	-.011	.003	.003		
Perceived Severity X	-2.36**	.018	.008	-.002	.000	.000		
Perceived Susceptibility X	2.94 **	.003	.012	.026	.131	.026		
Perceived Barriers X	2.45 **	.014	.008	.012	.111	.025		
Health Value X	-2.86**	.004	.011	-.101	.018	.021		
Future Consequences X	1.10	.271	.001	-.034	.120	.039		
Step 3								
Perceived Severity	9.19**	<.000	.123	.022	.035	.003	.309	.0003
Perceived Susceptibility	2.25*	.025	.007	.034	.497	.118		
Perceived Benefits	-2.32*	.020	.007	-.498	.042	.116		
Perceived Barriers	-1.01	.321	.001	-.329	.108	.111		

Appearance	-1.43	.161	.002	-.486	.081	.144
Health Value	1.35	.179	.002	-.064	.349	.105
Future Consequences	-2.07*	.038	.006	-.650	.022	.039
Self-Efficacy	-.96	.326	.001	-.011	.003	.003
Perceived Severity X	-2.35*	.018	.008	-.002	.002	.000
Perceived Susceptibility X	2.95 *	.009	.001	.026	.132	.026
Perceived Barriers X	2.46 *	.014	.008	.012	.111	.025
Health Value X	-2.87 *	.004	.011	-.101	.018	.021
Future Consequences X	1.14	.256	.001	-.034	.120	.039
Winning x Appearance	-0.42	.671	.000	-.060	.038	.025

Note, CI = confidence interval; LL = lower limit; UL = upper limit; *X*=Masculine Self-Identity Interaction Term; Future Consequences = *Consideration of Future Consequences*; Health Value = *Health Value & Importance*

*p <.05, **p <.01, ***p <.001

This second test shows an increase in our R^2 from .275 to .309, indicating our interactions helped explain more of the variance in weight-loss outcome measure scores. The *Masculine Self-Identity* interaction variables were tested, and four of the five variables showed statistically significant unique contributions to our prediction of our weight-loss outcome measure. In other words, *Masculine Self-Identity* moderated the relationship between four of the five predictors. The relationship between our *Consideration of WLS* measure and *Consideration of Future Consequences* was not moderated by *Masculine Self-Identity*. However, the relationships between our *Consideration of WLS* measure and *Perceived Severity, Perceived Susceptibility, Perceived Barriers,* and *Health Value & Importance* were all moderated by *Masculine Self-Identity*. We also see the contributions of each interaction term, in the table above under the semi-partial correlations (rab.c) column. *Perceived Susceptibility* and *Health Value &*

Importance had the greatest contributions to our R^2 each adding approximately 1.2% to our model when holding other variables constant.

Lastly, our *Winning* variable was tested as an interaction term with *Appearance*. This did not produce a statistically significant change in R^2, indicating that the *Winning* subscale did not moderate, or strengthen, the relationship between *Appearance* and our *Consideration of WLS* measure. Our *Winning* and *Appearance* interaction variable had a T-Value of -0.42 and a P-Value of 0.671, which was not statistically significant.

Hypotheses

Research Question 1: Does the proposed extended HBM predict men's consideration of WLS at a statistically significant level?

Hypothesis 1a: The proposed extended HBM predicts men's *Consideration of WLS* at a statistically significant level.

Results from the analysis support the hypothesis that the HBM predicts men's *Consideration of WLS* at a statistically significant level. The extended HBM variables account for .27 or 27% of the variance in the *Consideration of WLS* scores. Additionally, with the added moderation relationships, our model increased from .27 to .30, or to 30%.

Research Question 2: Does a *Masculine Self-Identity* moderate the relationship between health beliefs and *Consideration of WLS*?

Results from the analysis support the hypothesis that a *Masculinity Self-Identity* moderates four of the five health belief variables. In total, the four interaction terms uniquely added approximately a 3% increase in the predictive capability of the model.

Hypothesis 2a: Masculine *Self-Identity* will moderate the relationship between *Perceived Susceptibility* and *Consideration of WLS*. Specifically, when scores on Risk-Taking, Self-Reliance, Emotional Control are high the relationship from *Perceived Susceptibility* to *Consideration of WLS* would be weakened.

Results from the analysis support the hypothesis that *Masculine Self-Identity* moderates the relationship between *Perceived Susceptibility* and *Consideration of WLS*. However, our results show that with the addition of the moderator variable *Masculine Self-Identity*, there is a strengthened positive relationship between *Perceived Susceptibility* and *Consideration of WLS*, with higher scores on *Perceived Susceptibility* correlating with higher *Consideration of WLS*. The relationship plotted below shows us that men that scored high on *Masculine Self-Identity* and high on *Perceived Susceptibility* scored even higher on *Consideration of WLS* than men that endorsed low *Masculine Self-Identity.* Thus, a *Masculine Self-Identity* correlated to a stronger relationship between *Perceived Susceptibility* and *Consideration of WLS.* Our analysis found that when controlling for all other variables, this interaction uniquely contributed approximately 1.2% of the variance in *Consideration of WLS* scores.

Figure 5

Interaction plot between Consideration of WLS, Perceived Susceptibility, & Masculine Self-Identity

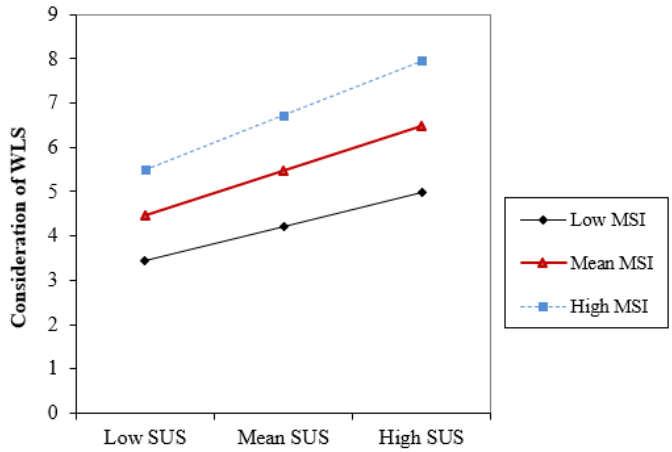
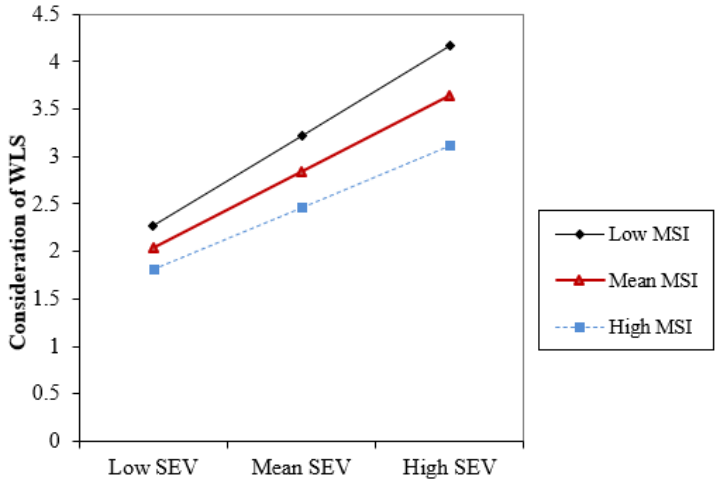


Figure 6

Interaction plot between Consideration of WLS, Perceived Severity, & Masculine Self-Identity



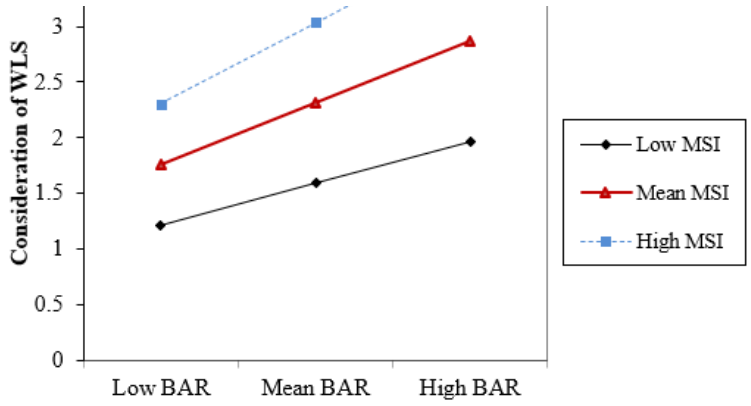
Hypothesis 2b: Masculine *Self-Identity* will moderate the relationship between *Perceived Severity* and *Consideration of WLS*. Specifically, when scores on Risk-Taking, Self-Reliance, Emotional Control are high, a relationship from *Perceived Severity* to *Consideration of WLS* would be weakened. Alternately, when scores on Emotional Control, Risk-Taking, and Self-Reliance are low, the relationship between *Perceived Severity* and *Consideration of WLS* would be strengthened.

Results from the analysis support the hypothesis that *Masculine Self-Identity* moderates the relationship between *Perceived Severity* and *Consideration of WLS*. As anticipated, the results show the initial relationship between *Perceived Severity* and *Consideration of WLS* was positive, meaning as *Perceived Severity* increased, *Consideration of WLS* also increased. With the interaction term added, the relationship between *Perceived Severity* and *Consideration of WLS* was strongest at low levels of *Masculine Self-Identity*. Meaning, the relationship changes as a function of *Masculine Self-Identity*, with a low level of Masculine Self-Identity strengthening the relationship between *Perceived Severity* and *Consideration of WLS*. The results found that this interaction uniquely contributes approximately .8% of the variance in *Consideration of WLS* scores.

Hypothesis 2c: *Masculine Self-Identity* will moderate the relationship between *Barriers* and *consideration of WLS*. Specifically, when scores on Risk-Taking, Self-Reliance, Emotional Control are high, the relationship between *Barriers* and *Consideration of WLS* would be weakened. We anticipate that men that endorse a stronger masculine identity are also likely to endorse more *Barriers*, and we anticipate these men to be less likely to consider surgery.

Figure 198

Interaction plot between Consideration of WLS, Barriers, & Masculine Self-Identity

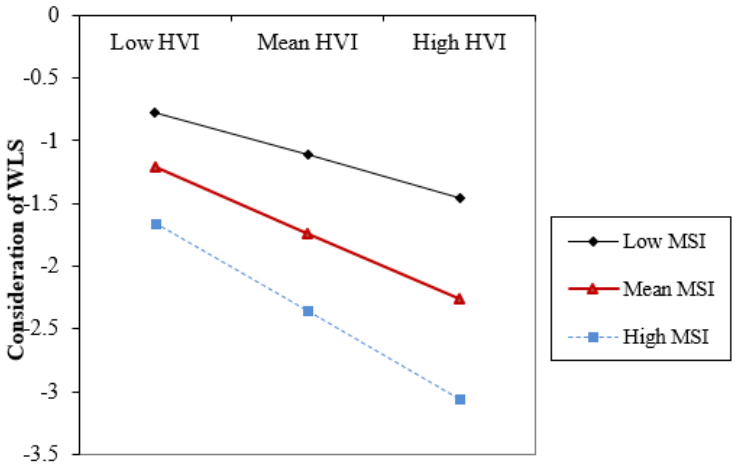


Results from the analysis support the hypothesis that *Masculine Self-Identity* moderates the relationship between *Barriers* and *Consideration of WLS.* With the addition of the moderator variable *Masculine Self-Identity*, the relationship between *Barriers* and *Consideration of WLS* became stronger, though not in the way hypothesized. When *Barriers* were high, lower *Masculine Self-Identity* correlated with lower *Consideration of WLS*. Thus, men that scored high on *Masculine Self-Identity* were more likely to score higher on *Consideration of WLS* when also scoring high on *Barriers* whereas men that scored low on *Masculine Self-Identity* were more likely to score lower on *Consideration of WLS*. Our results found that this interaction between *Masculine Self-Identity* and *Barriers* contributed to our R^2 by uniquely adding approximately .9% to our model.

Hypothesis 2d: *Masculine Self-Identity*, as measured by subscales Emotional Control, Risk-Taking, and Self-Reliance will moderate the relationship between *Health Value & Importance* and *Consideration of WLS*. Specifically, when scores on Emotional Control, Risk-Taking, and Self-Reliance are high, an inverse relationship between *Health Value & Importance* and *Consideration of WLS* would be strengthened. Alternately, when scores on Emotional Control, Risk-Taking, and Self-Reliance are low, the relationship between *Health Value & Importance* and *Consideration of WLS* would be weakened.

Figure 310

Interaction plot between Consideration of WLS, Health Value & Importance, & Masculine Self-Identity



Results from the analysis support the hypothesis that *Masculine Self-Identity* moderates the relationship between *Health Value & Importance* and *Consideration of WLS. Health Value & Importance* was not a significant predictor of *Consideration of WLS*. However, when adding *Masculine Self-Identity* as an interaction with *Health Value & Importance*, a statistically significant relationship emerged. At low levels of *Health Value & Importance*, participants that endorsed a higher *Masculine Self-Identity* scored lower on *Consideration of WLS.* This trend was strengthened as *Health Value & Importance* increased, so too did *Consideration of WLS* decrease. In other words, there was a stronger inverse relationship between *Health Value & Importance* and *Consideration of WLS* for men that endorsed high levels of *Masculine Self-Identity*. The interaction between *Masculine Self-Identity* and *Health Value & Importance* had the second greatest contribution to R^2 uniquely adding approximately 1.1%.

Hypothesis 2e: *Masculine Self-Identity* will moderate the relationship between *Consideration of Future Consequences* and *Consideration of WLS*.

There was a statistically significant inverse relationship between *Consideration of Future Consequences* and *Consideration of WLS* with a T-Value of - 2.73 and a P-Value of 0.006. Meaning, as participants endorsed considering their futures, they were less likely to consider WLS. However, results from the analysis did not find a statistically significant relationship between *Masculine Self-Identity* and relationship between *Consideration of Future Consequences* and *Consideration of WLS* with a T-Value of 1.10 and a P-Value of 0.271.

Exploratory Aim: Do negative body image attitudes, as represented by higher scores on *Appearance*, predict the likelihood of men considering WLS?

Results from a simple regression found that negative body image attitudes, as measured by the MBAS, did predict *Consideration of WLS* at a statistically significant level. The regression produced a T-Value of 3.24 and a P-Value of 0.001. Without controlling for other variables, negative body image attitudes as measured by the MBAS explained 2% of the variance in scores on *Consideration of WLS.*

Hypothesis 3a: Men that indicate higher levels of body dissatisfaction will be more likely to consider WLS as an obesity treatment.

As stated above, without controlling for other variables, we found that negative body image attitudes, as measured by the MBAS, did predict *Consideration of WLS* at a statistically significant level. The regression produced a T-Value of 3.24 and a P-Value of 0.001. As the T-Value was positive, we can concur that as men endorsed greater body dissatisfaction, they also endorsed higher *Consideration of WLS*.

Hypothesis 3b: Masculinity subscale *Winning* will moderate the relationship between *Appearance* and *Consideration of WLS.*

Results from the analysis did not find the subscale *Winning* to moderate the relationship between *Appearance* and *Consideration of WLS*. The T-Value was -0.42 and the P-Value was 0.6716. The P-value was not statistically significant.

Supplementary Findings

In addition to the main hypotheses, the survey included several open-ended questions to gather qualitative data. These questions were carefully selected to help inform future research as well as clinical practice methods in settings that support WLS or metabolic disease management. Responses were not forced to allow participants to share their genuine thoughts or to skip the question if desired. This choice was made to ensure more reliable responses from participants. The supplementary qualitative data was analyzed, and additional analyses were run to examine the relationship between BMI and *Consideration of WLS* and co-morbidities and the *Consideration of WLS.* These additional analyses were used to help inform future direction this research might take.

Participants were asked if they were familiar with what WLS is and 85% stated they were. Next, participants were asked if a medical doctor had ever discussed WLS with them. Of the 504 surveys used, 141 participants stated yes, 15 reported they were unsure, and 348 said no, to whether a doctor had discussed WLS with them. This means approximately 27% of participants have spoken to a medical doctor about WLS. Of the 504 participants, 231 (47%) gave responses that indicated a level of interest in WLS, 61 (13%) maintained they were neither interested nor disinterested, and 201 (40%) were not interested in WLS.

Of the 504 surveys, 280 participants reported having one of more of the comorbid conditions listed in Table 5. Additionally, 41 participants endorsed three or more co-morbid conditions. A regression analysis found that only two comorbidities were statistically significant predictors. Comorbidities had an R^2 of .05. This means approximately 5% of the variance in *Consideration of WLS* scores can be explained by these variables. However, as shown below, some of the comorbidities were endorsed by fewer than 50 participants, suggesting the findings might not be representative of the larger population living with those comorbidities. The two comorbidities that contributed to R^2 were heart disease and type II diabetes. BMI was not a statistically significant contributor.

Table 6

Co-Morbid Condition	n	%
Hypertension	154	31%
Sleep Apnea	133	26%
Type II Diabetes	76	15%
Heart Disease	40	8%
Insulin Resistance	23	5%
Metabolic Syndrome	21	4%
Dyslipidemia	10	2%

Table 7

Co-Morbid Condition	t	p	rab.c
Hypertension	-0.31	0.75	
Sleep Apnea	1.12	0.26	
Heart Disease	2.06*	0.04	.008
Dyslipidemia	2.19	0.98	
Insulin Resistance	1.81	0.07	
Metabolic Syndrome	0.81	0.14	
Type II Diabetes	2.19*	0.02	.009

*p <.05

Participants were asked two very specific questions regarding their perceptions about weight-loss. Specifically, participants were asked, “What benefits, if any, do you think you would get if you lost weight?” and “If you wanted to lose weight, what factors would motivate you?” These questions were answered by all participants and the response option was free text rather that forced choice. Despite this, there were very concrete themes that emerged for each question.

Following the six steps outlined by Braun and Clarke (2006), the researcher and a secondary coder utilized an inductive and thematic analysis approach to the data. Questions were reviewed individually three times, prior to beginning any initial coding. This step was done to ensure familiarity with the content and data prior to beginning any type of coding process. Having reviewed the data, the researcher began an initial coding process, in which responses were individually coded, without regard to a larger theme. Responses were coded based on what was said, even if the response did not fit the question. Following this initial coding, the researcher waited two weeks and re-coded all responses, improving continuity and accuracy of codes. The process was repeated again to produce a third code. The data was then reviewed for themes, and existing codes were mapped and sorted to develop themes.

Following the initial coding and themes, a second researcher reviewed the data independently. The researcher developed new codes and then later reviewed existing codes. The second researcher re-coded the data, adding or subtracting codes where they deemed appropriate. The second researcher generated themes that fit the codes she developed. Collaboratively, the data was re-reviewed for themes and the researchers developed a single coding scheme with primary themes and sub-themes. The final set of themes were agreed upon specifically as best

fitting the data. The data was then re-coded by each researcher to reflect the new coding scheme and themes. Finally, the re-coded data was then reviewed and synthesized. Codes that researchers agreed upon remained the same and codes that differed were evaluated in context of both codes, with the best fitting code selected. Where the best fit was a more difficult choice, the researchers discussed and agreed upon the final code. These steps were added to improve the reliability of the codes utilized.

The primary questions, regarding motivations and benefits of weight-loss, produced an array of responses, spanning internal and external factors. The qualitative questions produced a larger theme of improved physical health as a primary motivator, with relational and aesthetic benefits as significant factors as well. Improved overall health was the most commonly reported benefit and motivator for weight-loss. In fact, 27% of participants endorsed improved health as a benefit and then again 24% endorsed improved health as a motivational factor. Additionally, of the 503 responses to the question of benefits following weight-loss, 435 participants (86%) endorsed a benefit under the larger physical health theme. Following improved overall health, improved energy/stamina (26%), and alleviation of a co-morbid condition(s) (20%) were perceived to be major benefits to weight-loss. Alternately, motivating factors were primarily appearance (20%) and family/friends (18%). Themes and sub-themes that came up for each question are listed in the tables below.

Table 8

What benefits, if any, do you think you would get if you lost weight?

Theme	Sub-Themes	Percentage* Number of Responses (n)
Physical Health	Overall Health	27% (139)
	Less Pain	06% (34)

	Energy, Stamina	26% (131)
	Longevity	07% (36)
	Alleviated Medical Conditions	20% (102)
	Mobility	10% (50)
	Breathe Easier	04% (21)
	Physical Fitness	05% (25)
	Reduced Stress on the Body	05% (26)
Relational/Interpersonal	Sex, Romantic Relationships	02% (12)
Aesthetics	Appearance	09% (46)
	Clothing Fit/Options	03% (19)
External Motivators	Financial	01% (6)
Emotional Health	Feel Better, Reduced Negative Emotion	11% (58)
	Quality of Life	06% (30)
	Self-Esteem/Perception, Confidence	10% (50)

*Percentages were calculated using the total number of participants who gave a response to this question (n=503).

Table 9

If you wanted to lose weight, what factors would motivate you?

Theme	Sub-Themes	Percentage* Number of Responses (n)
Physical Health	Overall Health	24% (109)
	Longevity	12% (58)
	Physical Fitness	11% (52)
	Alleviated Medical Conditions	09% (42)
	Energy, Stamina	02% (12)
	Sleep	01% (06)
	Mobility	03% (16)
Relational/Interpersonal	Family, Friends	18% (82)
	Sex, Romantic Relationships	09% (41)
Aesthetics	Appearance	20% (91)
	Social Gain	01% (07)
	Clothing Fit/Options	02% (13)

External Motivators	Achievable Goals	05% (25)
	Having Help/ Plan	09% (43)
	Financial Incentives	05% (26)
Emotional Health	Feel Better, Reduced Negative Emotion	07% (32)
	Quality of Life	08% (38)
	Self-Esteem/Perception, Confidence	06% (28)

*Percentages were calculated using the total number of participants who gave a response to this question (n=453).

DISCUSSION

This study examined how a masculine self-identity might impact the relationships between health belief variables and the consideration of WLS. Literature has already demonstrated that masculine identity variables that can impact whether a man thinks his health is at risk (Levant & Wimer, 2014; Mansfield, Addis, & Mahalik, 2003). Furthermore, some studies have shown that higher endorsement of masculine norms is predictive of lower levels of engagement in preventative healthcare (Springer & Mouzon, 2011).Yet, a purely psychosocial perspective on underutilization of health service (e.g., Levant et al., 2009; Jeffries & Grogan, 2012)., or an exclusively masculinity and social norms perspective (Hammer et al., 2013; Levant & Wimer, 2014; Vogel et al., 2011) often fails to address the appraisal process in behavior-change (Abraham & Sheeran, 2005). And healthcare research, which does include appraisals of behavior change, fails to address masculine norms which impact a patient's decision-making process (Borkhoff, 2007; Cornally, & McCarthy, 2011, Fuchs et al., 2013; Imbus et al., 2018; Primomo et al., 2016). Thus, this study has considered that psychosocial, structural barriers and behavioral attitudes contribute to men's treatment-seeking beliefs and behaviors (Wee et al., 2014; Vogel et al., 2011).

This research this research utilized a modified health belief model, which captured structural barriers, health attitudes, and social norms. The original HBM, by Hochbaum, Kegeles, Leventhal, and Rosenstock (Rosenstock, 1974), provided a framework for explaining why people would not engage in preventative health care practices (Abraham & Sheeran, 2005). This model has been used with a variety of health behaviors including weight management and diabetes management studies (Kartal & Ozsoy, 2007; Sapp & Jensen; Sapp & Weng, 2007. This current study has considered what health beliefs correlate to a man's consideration of WLS, and,

conversely, what beliefs might dissuade a man from considering surgery. This study considered the variable *Masculine Self-Identity* as a moderator of health-behavior predictors. While answering the question of why men undergo WLS at such astoundingly low rates, is certain to be complex, these results help shed light on some of the relationships that may be most salient.

The study utilized a sample of self-identified men who reported a BMI of greater than or equal to 35. Of the 779 participants that took the main survey, 504 surveys were used for the analyses. The results of both the qualitative and quantitative analyses provide for insight regarding men's attitudes towards weight-loss and WLS. These findings supported literature that points to masculine identity variables impacting a man's health care choices and attitudes (Levant & Wimer, 2014; Mansfield et al., 2003). Findings from the analysis were diverse, with some relationships consistent with hypotheses, some opposite to hypotheses, and some were non-significant. These analyses supported the hypothesis that endorsing a *Masculine Self-Identity* does influence most of the relationships between health beliefs and *Consideration of WLS*. A stronger correlation between health belief variables *Perceived Susceptibility, Barriers, Health Value & Importance,* and *Consideration of WLS* emerged for the participants endorsing a higher *Masculine Self-Identity*. Alternately, the relationship between *Perceived Severity* and *Consideration of WLS* was actually weakened in men who endorsed a high masculine identity. This is not surprising given literature has suggested men that endorse traditional norms are less likely to endorse a need for help (Mahalik et al., 2003) This finding is consistent with the help-seeking literature that has found men struggle to access help due to endorsement of male norms (Vogel et al., 2011). To our knowledge there is no previous research examining this unique area of study.

The extended model illustrated by Orji et al. (2012) provided rationale for many of the variables included in the current model. However, three of our six primary predictors (i.e., without interaction terms) were not statistically significant contributors to the outcome variable. Our variables *Self-Efficacy*, *Appearance,* and *Health Value & Importance* did not have statistically significant contributions to *Consideration of WLS* as predictors in the model. While *Appearance* showed a correlation in a simple regression, it is not surprising it was non-significant when added to the model. Our expectation was that any contribution would be quite small given findings by Orji et al. (2012). However, regarding *Self-Efficacy* and *Health Value & Importance,* this finding was surprising. The HBM posits that some of the requirements for engagement in positive healthcare behaviors are sufficient value of health and belief that one has the ability to undertake the health necessary change (Janz, & Becker, 1984; Rosenstock, Stretcher, & Becker, 1988). Yet we found no significant correlation between either variable and *Consideration of WLS.* This could, perhaps, have been due to the measures. The *Self-Efficacy* measure rates confidence in ability to follow exercise and diet and the *Health Value & Importance* measure rates and value in eating healthy and exercising. It may be the case that this sample of participants does not value health at the level described in our measure. Furthermore, the participants may not be considering improving their diet or exercise, which could impact their confidence in their ability to do so. Further exploration is needed with these measures and constructs.

The remaining five variables were significant predictors and four of the moderation relationships were significant. Our analysis found that endorsement of a masculine identity resulted in a strengthening of the positive relationship between *Perceived Susceptibility* and *Consideration of WLS,* with men endorsing both a *Masculine Self-Identity* and higher levels

Perceived Susceptibility more likely to consider WLS. While the hypothesis proposed that if a man did perceive he was susceptible he would be more likely to consider WLS, a surprising finding was just how many men perceived themselves as susceptible to obesity-related health conditions. Of the 504 surveys, 353 participants endorsed more susceptible rather than less susceptible, meaning, 70% of the participants endorsed susceptibility to obesity-related health conditions. This is contrary to masculinity literature which argues masculine norms can serve as a means to deny susceptibility to obesity-related health concerns (Bandura, 1997; Mahalik et al., 2003). However, one explanation for *Perceived Susceptibility*, *Masculine Self-Identity*, and higher *Consideration of WLS* all correlating could have to do with men's desire to take action of they perceive they are susceptible to an ailment (O'Brien et al., 2005).

There is a significant amount of literature showing gender disparities in utilization of healthcare services and men's propensity to undervalue preventative healthcare (Christy, et al., 2014; Galdas et al., 2005). Considering this, of note is the significant role that *Perceived Severity* played. *Perceived Severity* uniquely added 12% to the model, making *Perceived Severity* the largest contributing predictor to the model. In other words, if a participant believed their health condition to be severe, they were more likely to endorse interest in WLS. Additionally, when interacting with *Masculine Self-Identity*, *Perceived Severity* uniquely added 1.2% the model. We found a strengthened relationship for *Perceived Severity* and *Consideration of WLS*, with men endorsing lower masculinity and high perceived severity more likely to consider WLS. In other words, consistent with our hypothesis, we found that at lower levels of *Masculine Self-Identity* there is a stronger positive relationship between *Perceived Severity* and *Consideration of WLS.*

There was a statistically significant interaction between *Health Value & Importance* and *Masculine Self-Identity* when predicting *Consideration of WLS* in the interaction model when

controlling for all other variables. Thus, while *Health Value & Importance* did not predict *Consideration of WLS* at a statistically significant level, with the addition of an interaction from a *Masculine Self-Identity*, there was a significant inverse relationship. At high levels of *Health Value & Importance* and high *Masculine Self-Identity*, there were lower levels of *Consideration of WLS.* Thus, the inverse relationship was stronger for men with high levels of masculinity and weaker for lower levels of masculinity. The interaction between *Masculine Self-Identity* and *Health Value & Importance* had the second greatest contribution to R^2 in the second model, uniquely adding approximately 1.1%. Lastly, the relationship between *Barriers* and *Consideration of WLS* became stronger when participants endorsed high levels of *Masculine Self-Identity*. Meaning, when men scored higher on masculinity measure and high on *Barriers,* they were more likely to consider WLS.

For exploratory findings, we found that negative body image attitudes, as represented by higher scores on *Appearance*, predicted the likelihood of men considering WLS at a statistically significant level without controlling for other variables. The relationship was positive in that men that rated higher body dissatisfaction were more likely to consider WLS. However, when added into the full model, *Appearance* did not predict *Consideration of WLS* at a statistically significant level. Results from the analysis did not find the subscale *Winning* to moderate the relationship between *Appearance* and *Consideration of WLS*. The P-value was not statistically significant. This finding was inconsistent with literature that has shown a competitive attitude is likely to be associated with concern for appearance (Kimmel & Mahalik, 2004).

Furthermore, recall that quantitatively *Appearance* was endorsement of body dissatisfaction, and it is of interest that while *Appearance* did not make a significant contribution to R^2 when controlling for other variables, qualitatively *Appearance* was endorsed as a

significant benefit to and a motivator of weight-loss. In other words, the idea of improving appearance was motivational while the endorsement of body dissatisfaction was not a large motivation to pursue WLS. This poses questions of whether presence of body dissatisfaction does not indicate value of appearance, or value of appearance is overshadowed by the stigma and drawbacks of WLS, or perhaps placing value on one's appearance is a better predictor of *Consideration of WLS* than the endorsement of dissatisfaction with one's appearance. These relationships might be explored further in future research.

Implications

The information provided from these health belief and *Consideration of WLS* relationships has some practical implications for healthcare providers. The HBM posits that sufficient motivation or health concern, belief that one is susceptible to the concern, and the belief that taking action is possible and would be beneficial are key to engagement in health-behaviors (Janz & Becker,1984). Using this framework, one suggestion for healthcare providers is to increase perception of severity and susceptibility rather in addition to provide health education. It may be that increasing perception of both variables would potentially increase men's consideration of WLS.

While these two concepts may seem similar, there is a significant difference in understanding the health risks associated with obesity and perceiving the susceptibility to a condition and severity in one's own health condition. One suggestion for this would be to integrate more screening measures into regular primary care visits. Perhaps utilizing screeners that ask questions regarding mobility and stamina would encourage more self-awareness of one's weight-related health impacts. Furthermore, there might be an after-visit handout that could be

generated showing a man's individual risk factors based on his individual health data (e.g., blood pressure, BMI, etc.). This may also be more useful than telling a person he or she is likely to move easier with weight-loss or that prolonged high blood pressure increases risk of heart disease. Of course, either of these interventions would need to be combined with other approaches.

The presence of co-morbidities data also produced notable findings. This data was forced choice of hypertension, sleep apnea, heart disease, dyslipidemia, insulin resistance, metabolic syndrome, type II diabetes or none. Participants were able to select as many as applied or none. This was to ensure the variables were obesity-related comorbidities rather than more general co-morbidities. Heart disease and type II diabetes were the two conditions that predicted interest in WLS. However, these conditions were not the two most endorsed conditions. Participants reported having hypertension and sleep apnea approximately twice as frequently as type II diabetes and nearly four times as frequently as heart disease. The reason for heart disease and type II diabetes being correlated with *Consideration of WLS* would be valuable to explore. Perhaps there is a greater sense of severity associated with the aforementioned medical conditions. Given that heart disease is the number one cause of death in the United States, and affects men twice the rate of women, it is possible physician's stress the severity of this medical condition more than others (CDC, 2017). Alternately, other conditions might prove more highly correlated with *Consideration of WLS* if the sample size were larger for these conditions.

The qualitative findings also shed light on potential benefits to weight-loss and motivators for weight-loss. Regarding benefits, a whopping 86% of 503 participants who responded, endorsed a sub-theme under the physical health improvements as a benefit of weight-loss. The top three physical health benefits were overall improved health (27%), energy/stamina

(26%), and relief from a co-morbid condition(s) (20%). Generally speaking, participants chose either overall health improvement with a mention of reducing the risk of a co-morbid condition, or they explicitly stated a desire to reduce symptoms of a current co-morbid condition. Thus, there was generally little overlap between the two sub-themes. As such, a good portion of participants cited lowered risk of a co-morbid condition or reduced impact of a co-morbid condition as a major benefit to weight-loss. Overall, the endorsement of physical health benefits would suggest that at least 86% of the participants placed value on their health, regardless of their current level of health.

While physical health was still a major theme in motivation as well, there were also several motivators that were found, outside of the physical health category. Motivation from an interpersonal standpoint was a significant theme, with 18% of participants citing family and friends as a motivator and another 9% noting favorable romantic pursuits as motivation. Additionally, appearance was a highly endorsed motivator (20%). These findings suggest significant interpersonal factors are implicated in the consideration of WLS.

This research adds to the literature by expanding our understanding of men's help-seeking behaviors, specifically within the context of obesity and WLS. Given that 47% of participants indicated they would be interested in WLS if cost were not a factor, it is possible that while the benefits seem myriad and motivation sufficient, the social and structural barriers to WLS are too great. This would be consistent with other literature that has found men to delay help-seeking (Tol et al., 2014; Vaidya et al., 2012). We have determined that masculinity does moderate the relationship between different health variables and the *Consideration of WLS*, sometimes in ways that were unexpected. Secondly, this study provides some understanding of

motivators for WLS and potential benefits of WLS. The findings from this study have practical implications for research and practice.

Limitations

Although this study has produced rich findings, it is important that these be considered within the context of practical limitations from the study's design. One of the major limitations to this study was that all data collected was self-report. Some of the most important variables that were self-reported were gender, height, weight and co-morbid conditions. There was very little to be done to verify the accuracy of the data being collected. However, some of the procedural steps taken by the researcher to ensure the accuracy of the data used includes:

1) Reviewing the demographic screener and full survey heights and weights to identify major discrepancies. If major discrepancies were found from one survey to the next, the data from that participant was removed from the dataset.
2) There were survey checks in place to ensure participants were reading the questions.
3) There was an additional screener question that would remove a participant from the survey if they did not answer correctly.

Another limitation to the study was that BMIs were used to determine if a participant could take the survey. WLS is not performed on those with a BMI of 35 unless co-morbidities are present. As there was no way to verify co-morbidities, and as many individuals have co-morbid conditions of which they are unaware, the BMI of 35 or greater was used without consideration of co-morbid conditions.

This study did not collect racial demographics due to masculinity literature citing a lack of differences in masculinity score outcomes based on race (Kivisalu et al, 2015). However, it would be useful to collect this information in the future as there may still be differences in regard to healthcare attitudes.

Although these limitations indicate caution should be exercised when attempting to generalize these findings to all men with a BMI of 35 or greater in the United States, there is still considerable value in the findings.

Future Direction

These initial findings suggest some complex interactions between a masculine identity and health beliefs regarding obesity and weight-loss. Regarding future research on masculinity and weight-loss or WLS, one area of interest would be related to men's health attitudes towards obesity and weight-loss. For example, it would be of interest to examine how many individuals were interested in weight-loss, to what degree they were interested in weight-loss, and then what types of approaches to weight-loss they might consider. This might produce more robust findings on what types of weight-loss methods men are receptive to trying. Furthermore, including the masculine self-identity piece could further examine how these attitudes might change based on a masculine identity.

It would also be advisable to collect more qualitative data on barriers to WLS in addition to barriers to weight-loss. There were some very useful findings from the initial data collected that suggest an opportunity to better inform future research and clinical practices. For example, many men endorsed family and relationships as being a motivator for weight-loss. Therefore, it may be advisable for weight-loss method communication (e.g., diet, exercise programs, WLS

programs) to include the family and relationship aspects. This type of information might help healthcare providers identify better motivators for individuals seeking weight-loss.

Additionally, the qualitative items for benefits and motivators were write-in rather than forced choice. This produced valuable findings for future studies. For example, *Perceived Severity* in our model was a significant predictor and included different categories of weight-related difficulties across domains (e.g., physical and social). Qualitatively we saw a similar theme of benefits of weight-loss being physical health-focused along with appearance-related and relational motivational factors. The qualitative data was a significant contribution to our understanding of benefits of weight-loss as the participants elected to share what domains and variables were most important to each of them. This data helps future researchers by informing what aspects of weight-loss and weight gain should be examined when considering impact of weight or weight-loss on a person's life.

From a health psychology perspective, and a healthcare disparities perspective, it would be of interest that certain co-morbidities correlated to *Consideration of WLS* while others did not. This is especially true considering the role *Perceived Severity* had in contributing to the variance in *Consideration of WLS* outcomes. Future research might inform what conditions people endorse as most severe and furthermore, whether the severity of those specific conditions is a motivator for weight-loss and WLS.

Lastly, future research could pursue why men underutilize WLS when our research indicates nearly 50% of the participants endorsed an interest. One area to further explore is the frequency in which primary care providers discusses WLS with men. As our research indicated 27% of men that may meet criteria had spoken to a medical doctor about WLS, it is possible that men are not approached frequently about the possibility of WLS as a weight-loss option. While

WLS is certainly not the first choice for weight-loss, it may be that providers are hesitant to refer patients or perhaps hesitant to discuss weight-loss with men (Borkhoff, 2007; Dutton et al., 2010; Ferrante, Piasecki, Ohman-Strickland, & Crabtree, 2009).

Conclusion

This study examined how masculinity affects the relationship between health belief variables and the consideration of WLS. The study considered psychosocial, structural barriers, and behavioral attitudes as part of the model contributing to men's treatment-seeking beliefs and behaviors. This research has found that masculinity has significantly changed the relationship between health beliefs as measured by *Barriers, Perceived Susceptibility, Health Value & Importance,* and *Perceived Severity* and *Consideration of WLS*. Endorsement of a *Masculine Self-Identity* had the greatest interaction effects with predictors *Health Value & Importance* and *Perceived Susceptibility* and our outcome *Consideration of WLS.* These initial findings suggest masculinity plays a role in *Consideration of WLS.* These findings support other literature that has found that health-behaviors are influenced by masculinity (Christy, et al., 2014; Salgado et al., 2019).

This research adds to the literature by expanding our understanding of men's help-seeking behaviors regarding weight-loss and WLS. These findings indicate that masculinity does moderate the relationship between different health variables and the *Consideration of WLS*. This study also found that 86% of the participants perceive improvement their health as beneficial and 47% of the participants indicated they would be interested in WLS if cost was not a factor. Our participants endorsed many benefits associated with weight-loss as well as many drawbacks of living with Class II or Class III obesity. In line with the drawbacks, we found that existing co-morbidities of heart disease and type II diabetes predicted a positive relationship with

Consideration of WLS. In summation, our findings indicate men do have an interest in weight-loss, and even an interest in WLS, despite men being a minority in pursuit of WLS. Furthermore, masculinity plays a role in the appraisal process of whether to pursue surgery.

Lastly, this study provides insight into benefits of weight-loss and motivations for WLS which have practical implications for both research and healthcare practices. Our findings indicated that *Perceived Susceptibility* and *Perceived Severity* were highly correlated with *Consideration of WLS*, with masculinity having the stronger moderating relationship with *Perceived Susceptibility*. These findings warrant further research into masculinity and *Consideration of WLS*, weight-loss and medical co-morbidities.

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APPENDICES

Appendix A: The Health Belief Model Scale in Obesity

Health value

1. I follow information about health issues including books, magazines, podcasts, radio, and/ or television.
2. I am eager to ask questions about health when I meet health professionals.
3. I participate in educational programs and meetings about health and life issues.
4. I am careful about the things I eat and drink every day and I try not to skip meals.
5. I do activities such as exercise, walking, cycling or running regularly.
6. I have a fixed sleep pattern.
7. I drink 6-10 glasses of water every day.
8. Nothing in my life can be more important that having a good health.

Susceptibility

1. There is a high risk of developing health problems due to obesity in any period of my life.
2. The possibility of developing health problems due to obesity greatly concerns me.
3. Being obese and health problems due to obesity will change all my life.
4. *I do not believe that I will develop health problems due to obesity as long as I take good care of myself.

Barriers

1. Being obese is not harmful to health

2. I will never be ready for the programs such as diet, exercise required to lose weight.

3. Whatever I do, I will never lose weight or reach the weight I aim.

4. I don't think it will be helpful for me even if I lose weight.

5. I find diet and exercise programs for losing weight boring and I become unhappy.

6. I feel that I lose the control over my life, when I follow doctor's advice to lose weight.

7. It is very difficult for me to change my eating habits.

8. It is very difficult for me to increase level of my physical activity.

Benefits

1. Losing weight according to a specific program is my biggest hope.

2. Losing weight during the following six months will be beneficial to my health.

3. I will look better physically, if I lose weight.

4. I will feel better and happy if I lose weight.

5. Changing my life style to reach the weight I aim will be good for me.

6. I believe that regular exercising will help to lose weight.

7. I believe that dieting will help to lose weight.

8. I believe that my social relations will be changed in a positive direction if I lose weight.

*Item is reversed Scored

Appendix B: IWQOL-Lite

Physical Function

1. Because of my weight I have trouble picking up objects.

2. Because of my weight I have trouble tying my shoes.

3. Because of my weight I have difficulty getting up from chairs.

4. Because of my weight I have trouble using stairs.

5. Because of my weight I have difficulty putting on or taking off my clothing.

6. Because of my weight I have trouble with mobility.

7. Because of my weight I have trouble crossing my legs.

8. I feel short of breath with only mild exertion.

9. I am troubled by painful or stiff joints.

10. My ankles and lower legs are swollen at the end of the day.

11. I am worried about my health.

Self-esteem

1. Because of my weight I am self-conscious.

2. Because of my weight my self-esteem is not what it could be.

3. Because of my weight I feel unsure of myself.

4. Because of my weight I don’t like myself.

5. Because of my weight I am afraid of being rejected.

6. Because of my weight I avoid looking in mirrors or seeing myself in photographs.

7. Because of my weight I am embarrassed to be seen in public places.

Sexual Life

1. Because of my weight I do not enjoy sexual activity.

2. Because of my weight I have little or no sexual desire.

3. Because of my weight I have difficulty with sexual performance.

4. Because of my weight I avoid sexual encounters whenever possible.

Public Distress

1. Because of my weight I experience ridicule, teasing, or unwanted attention.

2. Because of my weight I worry about fitting into seats in public places (e.g. theaters, restaurants, cars, or airplanes).

3. Because of my weight I worry about fitting through aisles or turnstiles.

4. Because of my weight I worry about finding chairs that are strong enough to hold my weight.

5. Because of my weight I experience discrimination by others.

Work (Note: For homemakers and retirees, answer with respect to your daily activities.)

1. Because of my weight I have trouble getting things accomplished or meeting my responsibilities.

2. Because of my weight I am less productive than I could be.

3. Because of my weight I don’t receive appropriate raises, promotions or recognition at work.

4. Because of my weight I am afraid to go on job interviews.

Appendix C: Male Body Attitudes Scale

1. I think I have too little muscle on my body. (M)
2. I think that my body should be leaner. (BF)
3. I wish that my arms were stronger. (M)
4. I feel satisfied with the definition in my abs (i.e., stomach muscles). * (BF)
5. I think that my legs are not muscular enough. (M)
6. I think my chest should be broader. (M)
7. I think my shoulders are too narrow. (M)
8. I am concerned that my stomach is too flabby. (BF)
9. I think that my arms should be larger (i.e., more muscular). (M)
10. I feel dissatisfied with my overall body build.
11. I think that my calves should be larger (i.e., more muscular). (M)
12. I think that I have too much fat on my body. (BF)
13. I think that my abs are not thin enough. (BF)
14. I think my back should be larger and more defined. (M)
15. I think my chest should be larger and more defined. (M)
16. I feel satisfied with the definition in my arms. * (M)
17. I feel satisfied with the size and shape of my body. *

18. Has eating sweets, cakes, or other high calorie food made you feel fat or weak? (BF)

19. Have you felt excessively large and rounded (i.e., fat)? (BF)

20. Have you felt ashamed of your body size or shape?

21. Has seeing your reflection (e.g., in a mirror or window) made you feel bad about your size or shape?

22. Have you been so worried about your body size or shape that you have been feeling that you ought to diet? (BF)

*Reverse Score Item

(BF)= Body Fat

(M)= Muscularity

Appendix D: Conformity to Male Role Norms Inventory-46

Selected Subscales

Emotional Control

1. I bring up my feelings when talking to others.*
2. I never share my feelings.
3. I like to talk about my feelings.*
4. I tend to keep my feelings to myself.
5. I tend to share my feelings.*
6. I hate it when people ask me to talk about my feelings.

Winning

1. In general, I will do anything to win.
2. Winning is not my first priority.*
3. I don't mind losing.*
4. It is important for me to win.
5. More often than not, losing does not bother me*
6. Winning is not important to me.*

Self-Reliance

1. I hate asking for help.

2. I ask for help when I need it.*

3. I never ask for help.

4. I am not ashamed to ask for help.*

5. It bothers me when I have to ask for help.

Risk-Taking

1. In general, I do not like risky situations.*

2. I enjoy taking risks.

3. I take risks.

4. I frequently put myself in risky situations.

5. I am happiest when I'm risking danger.

Appendix E: Weight-Loss-Related Behavior Self-Efficacy Scales

How confident are you that you can stick with eating healthful foods….

1. …even if you need a long time to develop the necessary routines.
2. …even if you have to try several times until it works.
3. …even if you have to rethink your entire way of nutrition.
4. …even if you have to make a detailed plan.

How confident are you that you can be physically active…

1. …even if you need a long time to develop the necessary routines.
2. …even if you have to try several times until it works.
3. …even if you have to rethink your entire way of physical activity.
4. …even if you have to make a detailed plan.

How confident are you that you can lose weight…

1. … even if you need a long time to develop the necessary routines.
2. …even if you have to try several times until it works.
3. …even if you have to rethink your entire way of losing weight.
4. …even if you have to make a detailed plan.

Appendix F: Consideration of Future Consequences Scale

1. I consider how things might be in the future and try to influence those things with my day to day behavior. (F)
2. Often, I engage in a particular behavior in order to achieve outcomes that may not result for many years. (F)
3. I only act to satisfy immediate concerns, figuring the future will take care of itself. (I)
4. My behavior is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions. (I)
5. My convenience is a big factor in the decisions I make or the actions I take. (I)
6. I am willing to sacrifice my immediate happiness or wellbeing in order to achieve future outcomes. (F)
7. I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years. (F)
8. I think it is more important to perform a behavior with important distant consequences than a behavior with less important immediate consequences. (F)
9. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level. (I)
10. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time. (I)
11. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date. (I)
12. Since my day-to-day work has specific outcomes, it is more important to me than behavior that has distant outcomes. (I)

13. When I make a decision, I think about how it might affect me in the future. (F)

14. My behavior is generally influenced by future consequences. (F)

(I)= Immediate

(F)= Future

Appendix G: Receptivity to Weight-loss Surgery

If financial cost was not a factor (i.e., the surgery was paid for), please indicate your level of agreement with each of the following the statement(s), on a scale from 1 to 5, with 1 being 'completely disagree' and 5 being 'completely agree', indicating how well they each describe your attitudes toward weight-loss surgery.

1. I will never want weight-loss surgery
2. I do not want weight-loss surgery at this time
3. I have not yet considered weight-loss surgery
4. I am considering weight-loss surgery
5. I know I want weight-loss surgery

Appendix H: Supplemental Questions

1. Please provide your weight in pounds (e.g., 270lbs).
2. Please provide your age in years (e.g., 34)
3. Please select your total annual family income range.
4. Less than $10,000

   $10,000-$29,999

   $30,000-$49,999

   $50,000-$69,999

   $70,000-$89,999

   $90,000 or more
5. Please indicate if you have been diagnosed with any of the following medical conditions (select as many as apply or select "none"): Heart Disease, Hypertension, Type II Diabetes, Insulin Resistance, Dyslipidemia, Metabolic Syndrome, Sleep Apnea.
6. Weight-loss surgery includes a variety of procedures performed on people that have obesity. Weight-loss is achieved by reducing the size of the stomach and therefore limiting how much food someone can eat. Were you familiar with weight-loss surgery before you read the description provided (i.e., did you know what it was)?
7. What benefits, if any, do you think you would get if you lost weight?
8. If you wanted to lose weight, what factors would motivate you?
9. Has a doctor ever discussed weight-loss surgery with you?
10. How did the doctor bring up/discuss weight-loss surgery with you? (Briefly describe)
11. Describe your response when the doctor suggested weight-loss surgery to you (e.g., what did you say to them, how did you feel about being asked, etc.).

Appendix I: Informed Consent form

University of Wisconsin-Milwaukee
Informed Consent to Participate in Research

Study title: Does Masculinity Moderate health beliefs toward consideration of weight-loss surgery?

Researcher[s]: Karaline Fusco, MEd., Educational Psychology Department
We're inviting you to participate in a research study. Participation is completely voluntary. If you agree to participate, you can always change your mind and withdraw. There are no negative consequences, whatever you decide.

What is the purpose of this study?
We want to understand the attitudes that men have toward weight-loss surgery.

What will I do?
This survey will include questions regarding gender attitudes, attitudes toward health, obesity-related challenges, appearance self-evaluation, and consideration of weight-loss surgery. This survey will ask questions about your self-identity attitudes, attitudes toward health, obesity-related challenges, and consideration of weight-loss surgery. It includes questions about your sexual satisfaction and your self-evaluation of your appearance. The survey will take about 20 minutes.

Risks

- Some questions may be very personal or upsetting. At any time, you may stop the survey if you are uncomfortable.
- Online data being hacked or intercepted: This is a risk you experience any time you provide information online. Amazon's Mechanical Turk is reportedly a secure system to collect this data, but we can't completely eliminate this risk.
- Amazon could link your worker ID (and associated personal information) with your survey responses. Make sure you have read Amazon's MTurk participant and privacy agreements to understand how your personal information may be used or disclosed.
- Breach of confidentiality: There is a chance your data could be seen by someone who shouldn't have access to it. We're minimizing this risk in the following ways:
    - All identifying information is removed and replaced with a study ID.
    - We'll store all electronic data on a password-protected computer.
    - We'll destroy this link after we finish collecting and analyzing the data.

Possible benefits: Your input will help us improve men's healthcare by understanding the attitudes men have toward obesity and weight-loss surgery.

Estimated number of participants: 400

How long will it take? Approximately 20 minutes.

Costs: There is no cost to you to be involved in the study.

Compensation: You will be compensated .50 to complete this survey.

Future research: De-identified data (all identifying information removed) may be shared with other researchers. You won't be told specific details about these future research studies.

Funding source: None

Where will data be stored? Data is anonymous, stored on non-networked account with password protection on a secure computer. Participants are given PI contact information. MTurk identifications will not be stored with data set.

How long will it be kept? APA requires that all data be kept for 7 years post publication. Data is anonymous, stored on non-networked account with password protection on a secure computer. Participants are given PI contact information. MTurk identifications will not be stored with data set.

Who can see my data?

- We (the researchers) will have access to de-identified (no names, birthdate, address, etc.). This is so we can analyze the data and conduct the study.
- The Institutional Review Board (IRB) at UWM, the Office for Human Research Protections (OHRP), or other federal agencies may review all the study data. This is to ensure we're following laws and ethical guidelines.
- We may share our findings in publications or presentations. If we do, the results will be presented in aggregate (grouped) and de-identified (no names, birthdate, address, etc.) data. If we quote you, we'll use pseudonyms (fake names).
- Amazon: Because they own the MTurk internal software, and to issue payment, Amazon will have access to your MTurk worker ID. There is a possibility Amazon could link your worker ID (and associated personal information) with your survey responses.

There are times when your identity wouldn't be kept secret, even with this certificate:

- If a government agency inspects the records, or to meet FDA requirements
- If you give someone written permission to receive this information, or if you tell someone the information yourself
- If you threaten to harm yourself or others
- In cases of child abuse
- If we're required to report cases of certain contagious diseases (such as HIV) to the state

Contact information:
For questions about the research, complaints, or problems: Contact:
Karaline Fusco knaegele@uwm.edu or Dr. Stephen Wester at srwester@uwm.edu

For questions about your rights as a research participant, complaints, or problems: Contact the UWM IRB (Institutional Review Board; provides ethics oversight) at 414-229-3173 / irbinfo@uwm.edu.

Please print or save this screen if you want to be able to access the information later.
IRB #: 20.144
IRB Approval Date: 1/9/2020

Agreement to Participate
If you meet the eligibility criteria below and would like to participate in this study, click the button below to begin the survey. Remember, your participation is completely voluntary, and you're free to withdraw at any time.

- I am at least 18 years old
- I identify as male
- I am proficient in English