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Investigating Perceptions of Capabilities and Appearance as Predictors of Satisfaction With Bariatric Surgery

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INVESTIGATING PERCEPTIONS OF CAPABILITIES AND APPEARANCE AS PREDICTORS OF SATISFACTION WITH BARIATRIC SURGERY

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The current study investigated bariatric surgery patients' perceptions of their physical capabilities and appearance, along with their attitudes toward bariatric surgery. A cross-sectional sample of pre-operative (N=41) and post-operative (N=82) patients completed a 54-item survey. All respondents completed the Appearance and Capabilities Scale (Long & Eash, 2016), which measures the extent to which people focus on their appearance as a source of their self-views, and the extent to which people appreciate their body's physical capabilities. They also completed measures of their current appraisal of their physical capabilities and their physical appearance. Pre-operative patients then rated their beliefs about how surgery would change their capabilities and appearance, and their desire to have bariatric surgery. Post-operative patients rated their beliefs about how the surgery had changed their capabilities and appearance, as well as their satisfaction with surgery. Results revealed that post-operative patients appraised their capabilities and appearance more favorably than pre-operative patients, they felt a greater appreciation for their physical capabilities, and they focused less on their physical appearance as a source of their self-views. Additionally, in pre-operative patients, expectations for how capabilities would be improved by surgery and expectations for how appearance would be improved by surgery were highly correlated and were both good predictors of desire for bariatric surgery. Post-operatively, perceptions of how capabilities have improved post-surgery was a strong predictor of satisfaction with surgery, but perceptions of how appearance has improved

was not. Overall the aims of the study were accomplished, and the findings demonstrate the value of the capabilities construct in assessing the patient experience of bariatric surgery.

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CHAPTER I

STATEMENT OF THE PROBLEM

Obesity is considered a global epidemic by the medical community, and it is increasing rapidly every year. The World Health Organization (WHO, 2016) estimates that in 2014, approximately 13% of adults were obese, worldwide. Heart disease, an illness linked with obesity, is the second leading cause of death in the United States (CDC, 2016). Other comorbidities include stroke, infertility, kidney stones, sleep apnea, asthma, and certain types of cancer (Pi-Sunyer, 2009; Sarwer, Lavery, & Spitzer, 2012; Simona, Alexandra, & Gabriela, 2015; WHO, 2016; Guh et al., 2009). The etiology of obesity is associated with genetics, environmental and social factors, as well as behavior (CDC, 2015). It is important to note, though, that the true impact of body size has yet to be definitively determined, despite the catastrophic reporting of its consequences (Blüher, 2010; Kramer, Zinman, and Retnakaran, 2013; Selby, 2017).

Compared to alternatives, such as weight-loss medications and behavioral change, which tend to provide modest physical change and often lead to regain, the most effective weight-loss treatment is bariatric surgery (P. E. O'Brien, 2010; Wadden, Butryn, Hong, & Tsai, 2014). Bariatric surgery is a procedure that restricts the digestive system, limiting food intake and nutritional absorption (Simona, Alexandra, & Gabriela, 2015). The four most common procedures are gastric bypass, sleeve gastrectomy, adjustable gastric band, and biliopancreatic diversion with duodenal switch (BPD/DS) (American Society for Metabolic and Bariatric Surgery, 2016). Bariatric surgeries work to drastically reduce body weight by lowering appetite, increasing satiation, changing how food tastes, reducing how much can be eaten, reducing nutrition absorption in the duodenum, absorbing less nutrients overall, expending more energy, and indirectly causing aversion effects from dumping, steatorrhea, and vomiting (P. E. O'Brien, 2010). The 'success' of bariatric surgery is often defined as the amount of weight loss and

retention of weight loss; however, other factors contribute to why an individual would be referred for the procedure, such as other comorbid conditions including type 2 diabetes, cancer, dyslipidemia, degenerative joint disease, and cardiovascular disease (Mokdad et al., 2003; Pi-Sunyer, 2009; Potteiger et al., 2004; WHO, 2016). There is a connection between weight loss and the alleviation of comorbid symptoms. Should the weight return, however, the symptoms will as well (Buchwald et al., 2004), thus emphasizing the importance of sustained weight loss following treatment. Although bariatric surgery is the most effective treatment currently available for weight loss (O'Brien, 2010; Wadden et al., 2014), approximately 20% of patients who undergo bariatric surgery do not lose a significant amount of weight post-operatively (Brolin, Kenler, Gorman, & Cody, 1989; Brolin, 2002). Further, after two years post-surgical intervention, 20-30% of patients regain some or all of their initial weight (Lombardo et al., 2015). Attempts to identify factors related to 'unsuccessful' surgeries have pointed in the direction of psychological factors.

There is conflicting literature on the existence of a relationship between specific pre-operative psychological distress and weight loss post-operatively (Dawes et al., 2016; Herpertz, Kielmann, Wolf, Hebebrand, & Senf, 2004). Mood disorders like depression have been seen to correlate with post-operative weight regain and complications after bariatric surgery (Ramalho et al., 2015). Additionally, Herpertz et al. (2004) noted that individuals suffering from serious psychopathology may have a harder time adhering to the demands of the controlled eating behavior necessary after bariatric surgery. Wimmelmann, Dela, & Mortensen (2014) found that psychological factors such as personality, cognitive functioning, and psychopathology indirectly affect weight loss after bariatric surgery, influencing the ability to regulate behavioral change, like diet and exercise (Wimmelmann, Dela, & Mortensen, 2014). Finally, poor self-esteem, perceived self-control, and perceived self-efficacy can lead to problematic strategies for losing weight

(Kinzl, 2016). Because psychological factors are related to the success of bariatric surgery, the National Institutes of Health (NIH) recommended that a psychological evaluation be performed prior to the procedure, to evaluate, treat, and prevent these complications from negatively affecting the surgical outcome.

Although weight loss is the primary measure of surgical success, another important indicator of success is Health Related Quality of Life. The Centers for Disease Control and Prevention (CDC) defines Health Related Quality of Life as "an individual's or a group's perceived physical and mental health over time." In a survey of patients undergoing surgery, physical health was ranked highest as the most important motivation for surgery, attributed to the significant impact that comorbidities of obesity cause on quality of life (D. J. Munoz et al., 2007; Wee, Jones, Davis, Bourland, & Hamel, 2006). One aspect of Quality of Life includes a patient's body image. Body image is a multidimensional construct that includes thoughts, behaviors, and emotions related to physical perceptions and attitudes (Cash, 2004; Sarwer et al., 2010). In a literature review, Teufel et al. (2012) noted inconsistent findings regarding the relationship of body image and bariatric surgery. Several studies reported body image satisfaction improved after bariatric surgery; however, other studies reported that body image does not always improve due to loose hanging skin following weight loss (Sarwer & Steffen, 2015). Additionally, bariatric surgery results in severe consequences for the body, including harsh side effects such as infection, bowel obstruction, stomal stenosis, and dumping syndrome that may reduce a person's perception of 'success' (Lee, Kelly & Wassef, 2007; Suter, Donadini, Romy, Demartines, & Giusti, 2011; Oria & Moorehead, 1998). In a meta-analysis including 72 separate studies, surgery had a more positive influence on physical quality of life compared to mental quality of life, as defined by the domains of the short form 36 health survey questionnaire (SF-36; Lindekilde et al., 2015).

Why patients choose to have surgery, how they evaluate their own 'success,' and how those factors contribute to quality of life is yet to be fully understood. Drawing from recent work that highlights health and physical quality of life as important motivations for bariatric surgery and as valued outcomes of bariatric surgery, the present research investigates a related concept: perceptions of one's physical capabilities. Long and Eash (2016) have suggested that focusing on and appreciating what one's body is capable of leads to improved body image and satisfaction, among other benefits. They have developed the Appearance and Capabilities Scale (ACS) to measure the extent to which people appreciate their capabilities, compared to the extent to which they focus on their appearance. Based on Long and Eash's (2016) theorizing about the role of capabilities appreciation in psychological wellbeing, the present research is guided by the idea that capabilities appreciation could operate similarly to Health Related Quality of Life when it comes to satisfaction with bariatric surgery.

The purpose of the present research was to investigate perceptions of capabilities in the context of bariatric surgery. Bariatric surgery patients who were visiting their physician either pre-operatively or post-operatively were invited to complete a survey that assessed their capabilities perceptions, appearance perceptions, and feelings about their surgery.

The cross-sectional design allowed for a comparison of pre-operative patients and post-operative patients on the variables of capabilities perceptions and appearance perceptions. It was hypothesized that scores on both variables would increase post-operatively, as a result of weight loss and increased physical functioning. The second hypothesis focused on pre-operative patients; it was expected that perceptions of how surgery would improve one's capabilities would better predict desire for surgery, as compared to perceptions of how surgery would improve one's appearance. This hypothesis was based on information regarding patient motivation for surgery,

specifically the expressed importance of physical health as a more important motivator than appearance (D. J. Munoz et al., 2007; Wee et al., 2006). The third hypothesis focused on post-operative patients; it was expected that perceptions of how one's capabilities improved post-operatively would better predict satisfaction with surgery, compared to perceptions of how one's appearance improved post-operatively.

Currently, there is a lack of understanding regarding specific psychological factors that influence outcome measures after surgery. Learning more about how bariatric surgery patients view their capabilities, and how those views relate to both desire to have the surgery (among pre-operative patients) and satisfaction with the surgery (among post-operative patients) could further inform psychological evaluations conducted prior to surgery, as well as promote more accurate and inclusive definitions of surgical 'success.' Improving and expanding the definition of success would be beneficial because, as indicators of surgical success, satisfaction and changes in psychological variables are often ignored by physicians (Ballantyne, 2003). It could also help improve psychological evaluations and interventions for both pre-operative and post-operative patients, to provide better support for patients who are preparing for the procedure or adapting to the many changes that they experience afterward.

CHAPTER II

LITERATURE REVIEW

Obesity

The Mayo Clinic (2015) defines obesity as a disorder that involves an excess amount of body fat, specifically a Body Mass Index (BMI) of 30 or higher. Average BMI is related to a country's GDP (Egger, Swinburn, & Amirul Islam, 2012), and obesity is more prevalent in developed nations like the U.S. (Lehnert, et al., 2013). Additionally, according to the World Health Organization (WHO), about 13% of adults were obese in 2014, globally, and obesity is widely considered an epidemic, doubling since 1980 (WHO, 2000). In the U.S., more than one third of the population is considered to be overweight (BMI>25) and that number is continually growing. One study estimated that population rates in the U.S. of overweight individuals have grown from 45% in 1991 to 58% in 2000, based on a survey of 195,005 adults aged 18 years or older (Mokdad et al., 2003, 2016). Kelly et al. (Kelly, Yang, Chen, Reynolds, & He, 2008) projected that by 2030, 2.16 billion and 1.12 billion individuals will be classified as overweight and obese respectively, or 38 and 20% of the world's population.

It should be noted that BMI classification cut-offs are arbitrary. Cynthia Ogden and her colleagues Susan Yanovski, Margaret Carroll, and Katherine Flegal, investigators at the National Center for Health Statistics, Centers for Disease Control and Prevention, the National Institute of Diabetes and Digestive and Kidney Diseases, and the National Institutes of Health (2007) stated that "obesity generally is defined as excess body fat. The definition of excess, however, is not clear-cut. Adiposity is a continuous trait not marked by a clear division into normal and abnormal (p.2087)." They go on to note that, because of the challenges of measuring body fat, obesity is often measured by body weight instead. However, body weight does not always serve as an accurate marker for body fat. A body fat percentage provides a more accurate picture of the

portion of body weight that includes adipose tissue rather than lean mass (Piers, Soares, Frandsen, & O'dea, 2000; Collazo-Clavell, & Lopez-Jimenez, 2008). Obesity defined by body fat percentage is BF > 25% in men and > 35% in women, an anthropometric cut-off designed by the World Health Organization in 1995, based on statistical norms of population-based samples (WHO, 1995; de Onis, & Habicht, 1996). In a sample of more than 2000 individuals, Pasco, Holloway, Dobbins, Kotowicz, Williams, & Brennan (2014) found that 31.6% of men and 17.3% of women were misclassified as obese according to BMI weight cut-offs (both over and under estimations), compared to sex-and-age-specific body fat percentage criteria. Given the large potential for misclassification, research pertaining to the diagnosis of obesity should be interpreted with caution.

Health Effects of Obesity

Despite the limitations of BMI, it is often employed in medical settings as a useful health indicator. In fact, a BMI that places a person in the medically defined category of "obese" has been documented as a major contributor to health problems such as type 2 diabetes, cancer, dyslipidemia, degenerative joint disease, and cardiovascular disease (Mokdad et al., 2003; Pi-Sunyer, 2009; Potteiger et al., 2004; WHO, 2016). Health conditions associated with obesity include high blood pressure, stroke, heart disease, infertility, kidney stones, sleep apnea, high cholesterol, asthma, and eleven types of cancers, including colon and breast cancer (CDC, 2016; Pi-Sunyer, 2009; Sarwer, Lavery, & Spitzer, 2012; Simona, Alexandra, & Gabriela, 2015; WHO, 2016; Guh et al., 2009). WHO also estimates that at least 2.8 million adults globally die each year as a result of being overweight or obese, and 300,000 of those deaths occur in the U.S. (Mokdad et al., 2016). Obesity is associated with the leading causes of death in the U.S., including heart disease and cancer (CDC, 2015). Social and emotional effects of obesity also

include depression, anxiety, discrimination and prejudice, as well as a decreased quality of life (Harvard School of Public Health, 2015). Obesity is associated with poorer health-related quality of life than smoking, problem drinking, or poverty (Sturm & Wells, 2001).

Despite the dire reports regarding the health effects of obesity, there is also literature that suggests there may be some exceptions to the notion that obesity always yields poor health outcomes. In fact, for some people, increased weight may serve as a protective factor. This conclusion comes from a biological study of cellular explanations of the 'obesity paradox.' Demaison & Mourmoura (2018) proposed that individuals who develop obesity are likely to develop more tonic hearts because of the accumulation of acid in the membrane phospholipids, as well as more elevated cardiac function. As a result, obese individuals (excluding morbidly obese [BMI>40]) have more efficient defenses against the fatal effects of severe comorbidities such as heart disease and diabetes.

Metabolic Health

Although obesity is associated with health outcomes, it alone may not tell the whole story. Metabolism is the biological process of the human body converting food into energy (Mayo Foundation for Medical Education and Research, 2017). Elevated levels of accumulated adipose tissue (fat), specifically in the abdomen, are linked to adverse metabolic effects. Hormones released from this tissue following chronic overnutrition can trigger uncontrolled inflammation responses and metabolic disorders like insulin resistance (Choe, Huh, Hwang, Kim, & Kim, 2016). However, not all obese individuals experience these adverse metabolic effects. A subgroup of obese individuals are considered "metabolically healthy," because of a lack of metabolic disorders like type 2 diabetes, dyslipidemia, and hypertension (Blüher, 2010). The prevalence of this group is still debated, with studies providing evidence that anywhere from 10 to 25% of obese

individuals are metabolically healthy (Raeven, 2003; Sims, 2001; Ferrannini, Natali, Bell, Cavallo-Perin, Lalic, & Mingrone, 1997; Bonora, et al., 1998).

Mattias Blüer (2010) suggests that only moderate weight loss with changes to diet and exercise can transition obese individuals from metabolically unhealthy to healthy. Supporting the value of placing increased attention on metabolic health, a recent meta-analysis found that metabolically unhealthy individuals, regardless of weight status, are at greater mortality risk than metabolically healthy individuals (Kramer, Zinman, and Retnakaran, 2013). However, this same meta-analysis also found that individuals who are obese but metabolically healthy maintain their increased mortality risk compared to normal-weight individuals after 10 years, and that increases in BMI are related to increases in blood pressure and insulin resistance in both metabolically unhealthy and healthy individuals. The authors concluded that a BMI that falls in the overweight or obese category is not benign.

Body Mass Index (BMI)

BMI is a metric used by the medical community to classify a person's weight as "underweight," "normal," "overweight," or "obese." It is calculated by dividing a person's weight in kilograms by the square of their height in meters. The BMI, or originally the Quetelet Index, was developed in 1832 to record the height and weight of men enlisting in the Belgian military, because it generates a statistically normal curve (Smalley, Knerr, Kendrick, Colliver & Owen, 1990; Oliver, 2005; Nicholls, 2013; Blackburn, & Jacobs Jr, 2014; Selby, 2017). In 1972, Keys, Karvonen, Kimura, and Taylor published an article (now cited more than 2,000 times) using the Quetelet Index, giving it the modern BMI title. In their article, the authors set out to create a relative weight index, and provide support for its use by reporting on BMI and body fat data collected from Europe, Japan, South Africa, and the U.S. In her book *The Body Size and*

Health Debate (2017), Christine Selby emphasized the fact that the BMI was created to assess the population, and not measure individuals. She concluded that BMI is a specific, but not sensitive measure of obesity. This means that BMI is useful for classifying individuals without excess adiposity as non-obese, but not for classifying individuals with excess adiposity as obese. Moreover, it is important to note that individuals on the borderline of classification cut-offs do not significantly differ, implying that the category distinctions reflect an arbitrary determination (Stommel & Schoenborn, 2010).

Although BMI is a straightforward metric derived from a person's height and weight, it is intended as a measure of body fat. Because it does not measure exactly what it seeks to measure, it leaves room for error. For example, in an Australian population-based study, 19.9% of women and 46.1% men with high body fat percentages were not classified as obese according to BMI criteria (Pasco, et al., 2014). Over- and under-estimations are often based on body shape; for example, BMI overestimates body fat in individuals with more muscle mass like athletes, while it underestimates body fat in individuals who have lost muscle mass such as the elderly (National Heart, Lung and Blood Institute, 2018).

In addition, error from the BMI metric is more common for some groups than others. In a study with a very large sample (N=13,601), BMI was correlated with body fat percentage more strongly for women ($r = 0.87$) than for men ($r = 0.65$), with specific limitations in differentiating lean mass from fat for men and the elderly (Romero-Corral et al., 2008). Because women have different body compositions than men (specifically, women have more fat stored in subcutaneous tissue than men do), at the same BMI, women will have a considerably higher percentage of body fat (Ogden et al., 2007). This means that BMI readings will place women into weight categories with more accuracy than these readings place men into weight categories. Additionally, ethnic

differences highly influence BMI (Flegal, et al. 2012). More specifically, Hispanic American women tend to have higher body fat percentages compared to European American and African American women, when BMI is between 30 and 35 (Fernández, et al., 2003). Also, both male and female non-Hispanic African Americans tend to have lower body fat percentages at the same BMI compared to other racial groups (Flegal, et al., 2008). Tojek et al. (2017) described specific limitations to BMI including "(a) an inability to distinguish between fat and fat-free (lean) body mass, which may be a cause of obesity underestimation in older adults, and its overestimation in those with a muscular build (e.g. athletes); (b) the failure to determine fat distribution, such as waist circumference or waist-to-hip ratio; (c) a dependence on the accuracy of reported height, which frequently decreases as patients age; (d) its relation to body fluid fluctuations; and (e) the influence of age, gender, smoking status, and comorbidities, which is not taken into account by the rigid borders of BMI ranges," citing two international task force initiatives (Piepoli, et al., 2016; Di Angelantonio, et al., 2016; Winter, MacInnis, Wattanapenpaiboon & Nowson, 2014).

Considering the ample room for error allowed by the BMI metric, one might wonder whether more direct methods of measuring adipose tissue (fat cells) exist. They do, and they include hydrostatic weighting, dual-energy X-ray absorptiometry, air displacement plethysmography, skinfold thickness measurement, and waist-to-hip circumference ratios (Romero-Corral et al., 2008; Wyatt, Winters, & Dubbert, 2006). However, these can be more time consuming and cost prohibitive compared to the ease with which a BMI can be calculated. Another concern about BMI comes from Nicholls (2013), who argues that there is a deficit in the literature regarding alternative perspectives on the use of categorization and standardization to classify overweight and obesity. He argues that body size is far more complex, and that using standardized definitions implies certainty and objectivity that is misleading. Selby (2017) adds

that correlational studies on BMI imply that a relationship exists between weight and mortality risk, but consumers assume causation, despite a lack of evidence to suggest it.

The Biopsychosocial Model

According to the CDC (2015), the etiology of obesity follows a biopsychosocial model. One component of this model is genetics. Genetics play a number of roles in their contribution to obesity, affecting hunger, satiety, metabolism, and how fat is stored and burned. Obesity is also regulated by the psychological component of behavior, particularly behaviors related to both diet and exercise. Finally, a person's environment, in the context of society on both macro and micro levels, can contribute to obesity.

Biological Contributors to Obesity

Heritability estimates for obesity range from 0.50 to >0.70 (Walley, Blakemore, & Froguel, 2006), meaning that 50-70% of the variation in weight in the population can be attributed to variation in genes. Individuals who are obese can be divided into syndromic or non-syndromic. With syndromic obesity, weight is related to a genetic syndrome (Prader-Willi syndrome, Bardet-Biedl syndrome, Cohen syndrome, Ayazi syndrome, and MOMO syndrome); with non-syndromic obesity, weight is not related to a genetic syndrome (Haqq, 2010; Walley, Asher, & Froguel, 2009). Syndromic obesity is accompanied by a developmental delay, dysmorphic features, organ-specific abnormalities, hyperphagia, and other signs of hypothalamic dysfunction (Haqq, 2010). For non-syndromic obesity, there are four predominating genetic relationships: human leptin and leptin receptor deficiency, pro-opiomelanocortin deficiency, prohormone convertase1, and human melanocortin 4 receptor deficiency. Leptin, with receptors in the hypothalamus, helps coordinate appetite, metabolism, and energy expenditure (O'Rahilly, Farooqi, & & Beales, 2009). Signals to the brain indicating a reduction in leptin levels indicate nutritional deprivation, which results in a

cascade of energy conservation and increased food intake behaviors. The most frequent problem with this system is a lack of leptin receptors. With too few receptors, the signal for adequate nutrition is weakened, and the body responds with an increase in nutritional conservation (storing more adipose tissue). Pro-opiomelanocortin deficiency and the prohormone convertase1 gene are connected to the leptin-hypothalamus system, are rare, and are usually comorbid with other, more problematic symptoms like hypocortisolism, which can be fatal. Human melanocortin 4 receptor (MC4R) deficiency is much more common and can be tested for neo-natally. This mutation also tends to ameliorate over time so that adults report a reduction in hunger and hyperinsulinemia. New information on non-syndromic obesity is continuously emerging with the advent of technology, including genome-wide analysis (GWA; Walley et al., 2009). So far, GWA studies have not supported previous literature in familial heritability studies, or candidate-gene association theories, implying that the genetic factors related to non-syndromic obesity are still largely unknown.

Psychological Contributors to Obesity

Behavioral associations with obesity include diet and physical activity (CDC, 2016). There is an ideal balance of energy consumed and energy output that is regulated by what someone eats and how much they move. The CDC (2015) recommends a specific diet that emphasizes the consumption of whole grains, fruits, vegetables, lean meats, and low-fat or fat-free dairy products. The CDC also has specific guidelines for exercise that recommend adults perform at least 150 minutes of moderate intensity activity or 75 minutes of vigorous intensity activity, or a combination of both, along with two days of strength training, per week. As noted above, the endogenous motivations for these behaviors can be affected by genetic variations. Epigenetics can play a role in the interaction between behavior and environment on whether or

not these mutations actually express themselves phenotypically in obesity, so attending to behavioral patterns is important when considering the etiology of this disease (Herrera, Keildson, & Lindgren, 2011). Behavioral risk factors for obesity include the number of hours of television a person watches each day, the amount of sleep they get each night, how they cope with stress, and many more (CDC, 2016). Inversely, increased cardiorespiratory fitness, even in individuals with overweight and obese BMI, has demonstrated reductions in the metabolic contributors to health risk (Wedell-Neergaard, Eriksen, Grønbæk, Pedersen, Krogh-Madsen, & Tolstrup, 2018).

Social Contributors to Obesity

The social effects on the etiology of obesity begin when a child is conceived. According to the Harvard School of Public Health (2015), pregnant mothers who smoke, who are diabetic, or who are overweight may have children who are more likely to grow up to be obese adults. Additionally, parents and family members shape how people behave and what their values are, especially in terms of food and exercise (Harvard, 2016). Kumanyika (2007) suggested that demographic variables such as ethnicity can determine differences in food-related beliefs, preferences, and behaviors, especially in minority populations where the prevalence of obesity is higher than the national average. People are also influenced by media, and the marketing of cheap and fast food. Lower income neighborhoods specifically have less availability of healthful foods versus fast food restaurants (Kumanyika, 2008). Additionally, aspects of culture, such as race, ethnicity, education level, and even region, can have an impact on what kind of food is enjoyed, is available, and what they know about it. Like diet, activity level can also be influenced by social factors, such as workload and dependents. Schools, neighborhoods, and work locations can all influence how much and what kind of activity is in people's lives. How walkable a route to work is can even factor in. On a macro level, policies that contribute to activity include land-

use, access to public transportation, and bike-friendly and pedestrian-friendly street designs (Harvard School of Public Health, 2015). The relationship between socioeconomic status (SES) and obesity is complex; for example, its effect can differ depending on gender and location. In developed countries, there is a negative association between SES and BMI, while a positive association exists in countries with low development, as a symbol of higher status (McLaren, 2007). Other environmental factors include an overall shift in increased food supplies, larger acceptable portion sizes, increases in sedentary occupations, decreased leisure time, increased use of electronics, inadequate sleep, and increased use of medication with weight gain side effects (Heymsfield & Wadden, 2017; Hall, Guo, Dore & Chow, 2009; Popkin & Hawkes, 2016; Church, et al., 2011; von Loeffelholz, 2014; Apovian, et al., 2015; McAllister, et al., 2009).

Bariatric Surgery

WHO (2016) listed the primary treatments for obesity as weight and lifestyle management, diet, exercise, drug therapy, bariatric surgery, psychological support, familial support, and social support. Behavioral interventions included in lifestyle management are: 1) establishing realistic goals related to BMI; 2) increasing physical activity in daily life; 3) establishing an exercise plan; 4) establishing a diet plan; 5) increasing psychological, familial, and social support; 6) decreasing other life stressors where possible; 7) cessation of substance use such as tobacco and alcohol; and 8) increasing coping strategies for stress (Simona et al., 2015). First line treatment is lifestyle management and psychological support; however, in randomized control trials, this intervention has produced only modest weight loss (P. E. O'Brien, 2010). Behavior modification and medications only result in an 8-10% reduction in weight (Wadden et al., 2014). Drug therapies, such as noradrenergic and fenfluramines, have been shown to contribute to only a minor change in weight, insufficient to influence comorbidities. Drug

therapies can also result in problematic side effects, such as primary hypertension and valvular heart disease (Ioannides-Demos, Proietto, Tonkin, & McNeil, 2006). For patients who meet criteria and have made 'unsuccessful' attempts using alternative methods to lose weight, bariatric surgery is proposed as the next treatment option.

Eligibility Criteria

Bariatric surgery is often described as the final option for individuals who have been unable to lose a substantial amount of weight using other, non-surgical methods (Arterburn & Courcoulas, 2014). The American Society for Metabolic and Bariatric Surgery (ASMBS) recommends that individuals must meet the following requirements before undergoing bariatric surgery: BMI ≥ 40, or more than 100 pounds overweight; BMI ≥35 and at least two obesity-related co-morbidities such as type 2 diabetes (T2DM), hypertension, sleep apnea and other respiratory disorders, non-alcoholic fatty liver disease, osteoarthritis, lipid abnormalities, gastrointestinal disorders, heart disease, obesity-hypoventilation syndrome, Pickwickian syndrome, nonalcoholic steatohepatitis, pseudomotor cerebri, venous stasis disease, severe urinary incontinence, or debilitating arthritis; or attempts have been made to lose weight without achievement of a sustained 'healthy' body weight (Simona et al., 2015; Mechanick, et al., 2013). Despite the invasiveness of a surgical operation, mortality is rare, laparoscopic options are available, and treatment is completed with a single operation (P. E. O'Brien, 2010).

Bariatric Surgery Procedures

The surgical procedures can be classified as restrictive, malabsorptive, or mixed type, with the mixed type demonstrating the most effectiveness for weight loss success (Lopes et al., 2015). The ASMBS lists four common forms of surgery, including gastric bypass, sleeve gastrectomy, adjustable gastric band, and biliopancreatic diversion with duodenal switch (BPD/DS). In the

U.S. in 2012, approximately 50% of bariatric surgeries were laparoscopic gastric bypass, 40% were laparoscopic sleeve gastrectomy, 6% were gastric banding, and 5.3% were BPD/DS (Buchwald & Oien, 2013; Khan et al., 2015). With any of the different procedures, patients will need to adhere to a lifetime of vitamin supplementation like iron and calcium; however, solely restrictive surgeries require less supplementation.

Focusing on the two most common procedures, a sleeve gastrectomy is the removal of approximately 80% of the stomach, allowing food to move through the small portion that is left. Advantages include a lack of foreign objects in the body, while a disadvantage is that the procedure is non-reversible. A gastric bypass, considered the 'gold standard,' is when the small intestine is linked to a smaller portion of the stomach so that food spends very little time between the esophagus and the intestine. An advantage of gastric bypass is that weight loss resulting from this surgery has the longest-term benefits compared to alternatives (Brolin, 2002), while disadvantages include a more technically rigorous procedure, and thus more opportunities for complications (ASMBS, 2016).

Bariatric surgeries work to drastically reduce body weight by reducing appetite, inducing satiety, altering the taste of food, restricting intake, diverting nutrients from the duodenum, malabsorption of nutrients, increasing energy expenditure, and indirectly causing aversion effects from dumping, steatorrhea, and vomiting (P. E. O'Brien, 2010). In a meta-analysis published in the *Journal of the American Medical Association (JAMA),* Buchwald et al. (2004) found that in morbidly obese patients (BMI>40; morbidity implies that weight is causing or worsening significant medical problems), bariatric surgery was an effective weight loss treatment and a substantial majority of patients showed improvement or resolution in diabetes, hyperlipidemia, hypertension, and obstructive sleep apnea (Buchwald, 2004). The LABS study, funded by the

National Institutes of Health (NIH), is a longitudinal assessment of bariatric surgery carefully evaluating outcomes, collected in multiple locations, by multiple providers, from a diverse population. The LABS study includes three phases; phase one focuses on the first 30 days post-operation, phase two focuses on long-term outcomes including weight, comorbidity, and behavioral changes, while the third phase focuses specifically on diabetic and psychosocial changes. The ASMBS defines bariatric surgery as a success when at least half of the excess weight is lost, and the loss is maintained for at least five years (ASMBS, 2016). However, the LABS study has only published results from three-year follow-up data. Initial reports indicate that in a sample size of 2,458, participants who received gastric bypass lost 31.5% of their baseline weight, and those who received the gastric banding lost 15.9% (Courcoulas et al., 2016). They also observed substantial remission in comorbidities such as diabetes (68.0% for the gastric bypass group/29.4% for the gastric banding group), dyslipidemia (61.6%/25.9%), hyperlipidemia (59.7%/23.5%), high triglycerides (83.9%/60.4%), and hypertension (41.0%/18.8%).

Bariatric Surgery Side Effects

Side effects of bariatric surgery include perioperative complications such as wound infection, anastomotic leak, gastrointestinal tract hemorrhage, bowel obstruction, and pulmonary embolus; late complications are stomal stenosis, and incisional hernia (Ma & Madura, 2015; American Society for Metabolic and Bariatric Surgery, 2008). The LABS study showed that laparoscopic patients have a reduced incidence of iatrogenic injury to the spleen requiring splenectomy, wound infection, incisional hernia, and perioperative mortality, but higher rates of bowel obstruction, intestinal hemorrhage, and stomal stenosis (Dumon & Murayama, 2011). According to Lee, Kelly, and Wassef (2007), complications with bariatric surgery such as abdominal pain, suboptimal weight loss, diarrhea, gastrointestinal bleeding, or wound infections

may be addressed quickly after surgery, or they may be a chronic condition. In a meta-analysis, Maggard et al. (2005), documented the prevalence of "adverse events" because of surgery including GI symptoms such as dysphagia and dumping syndrome among others (RYBG 16.9%), reflux (RYBG 10.9%), vomiting (RYBG 15.7%), nutritional and electrolyte abnormalities (RYBG 16.9%), and surgical complications including anastomotic, stoma-related, bleeding, reoperation, wound, and others (RYBG 18.7%). Almost immediately following surgery, patients demonstrate increased glycemic control, and a reduction in cardiovascular risk (Lopes et al., 2015). Improvements in insulin resistance and homeostatic glucose have been associated with weight loss following surgery (Lopes et al., 2015; Piché et al., 2014). "Dumping syndrome" occurs in 70 - 76% of patients within a year following the surgery, and includes abdominal pain, nausea, diarrhea, flushing, tachycardia, and syncope (Mechanick et al., 2013). In a systematic review published by the *Journal of the American Medical Association*, Puzziferri et al. (2014) examined long-term follow-up studies of bariatric surgery patients. The authors found that, comparatively, the gastric bypass surgery fared better than the gastric band on outcomes including weight loss, changes in type 2 diabetes, changes in hypertension, and changes in hyperlipidemia. However, there were not enough efficacious studies to support the claim that bariatric surgery had long-term beneficial outcomes because there has been little research more than a few weeks after surgery.

Recently, the LABS-2 study demonstrated that weight loss surgery is associated with an increased risk to develop alcohol use disorder because of high blood alcohol concentration levels (King, et al., 2017; Steffen, Engel, Wonderlich, Pollert, & Sondag, 2015; Spadola, Wagner, Dillon, Trepka, Cruz-Munoz, & Messiah, 2015; Li & Wu, 2016; Blackburn, Hajnal, & Leggio, 2016; Backman, Stockeld, Rasmussen, Näslund, & Marsk, 2016). Additionally, nationwide

studies, conducted across developed countries including Sweden and Australia, demonstrate an increase in suicide and self-harm rates after bariatric surgery (Neovius, et al., 2018; Lagerros, Brandt, Hedberg, Sundbom, & Bodén, 2017; Morgan & Ho, 2017). Results from these studies do not allow conclusions to be drawn as to whether surgical intervention increases the likelihood for self-harm and suicide, or individuals already at greater risk of these behaviors are receiving surgery (Spittal & Frühbeck, 2018; Courcoulas, 2017; Adams, et al., 2017). However, a study published in the *Journal of the American Medical Association* observing 1,888 patients for more than five years found that surgically treated patients expressed a higher risk for new-onset depression and sleep disorders compared to patients treated with other medical weight loss interventions (Jakobsen, et al., 2018).

It should be noted that approximately 20% of patients who undergo bariatric surgery do not lose a significant amount of weight post-operatively (Brolin, Kenler, Gorman, & Cody, 1989; Brolin, 2002). Also, after two years post-surgical intervention, 20-30% of patients regain some or all of their initial weight (Lombardo et al., 2015). Attempts to identify factors related to 'unsuccessful' surgeries have pointed in the direction of psychological factors.

Psychological Evaluation

In 1991, NIH held a Gastrointestinal Surgery for Severe Obesity Consensus Development Conference "convened to evaluate available scientific information and resolve safety and efficacy issues related to a biomedical technology," and made these five recommendations:

> (1) Patients seeking therapy for severe obesity for the first time should be considered for treatment in a nonsurgical program with integrated components of a dietary regimen, appropriate exercise, and behavioral modification and support, (2) gastric restrictive or bypass procedures could be considered for well informed and motivated patients with

> acceptable operative risks, (3) patients who are candidates for surgical procedures should be selected carefully after evaluation by a multidisciplinary team with medical, surgical, psychiatric, and nutritional expertise, (4) the operation be performed by a surgeon substantially experienced with the appropriate procedures and working in a clinical setting with adequate support for all aspects of management and assessment, and (5) lifelong medical surveillance after surgical therapy is a necessity. (NIH, 1991)

Until these recommendations were published, there was no standardization to the process leading up to surgery. The recommendations were based on an accumulation of research collected for approximately 15 years prior to the conference, since the initial application of gastrointestinal surgery to the condition of obesity. The psychiatric evaluation recommended by NIH was supported by literature indicating that "significant psychosocial and economic problems frequently are experienced by persons with severe obesity" (NIH, 1991, p. 3).

Pre-operative psychological evaluations serve to screen patients for risk factors associated with a lack of success in surgical outcome, as well as identify contraindicators to surgery (Martinez, 2014). According to Bauchowitz et al. (2005), a psychological evaluation before surgery is now a standard procedure (and often a requirement for insurance coverage; Engstrom, 2014). This psychological evaluation is typically accompanied by a programmatic series of interventions to help establish weight loss behaviors such as dietary education and physical activity recommendations prior to surgery. The pre-operative evaluations and interventions, however, are not standardized (Bauchowitz et al., 2005; Sogg, Lauretti & West-Smith, 2016; Kalarchian, et al., 2007). The ASMBS suggestions for the pre-surgery psychological evaluation in 2004 include:

> 1) Behavioral assessment, in particular previous attempts at weight management, eating and dietary styles (e.g., binge eating, overeating, grazing, night eating), physical activity and inactivity, substance use, health-related risk-taking behavior (e.g., impulsive behavior, compulsive behavior, compliance), and legal history; 2) cognitive and emotional assessment, in particular cognitive functioning, knowledge of morbid obesity and surgical interventions, coping skills, emotional modulation, boundaries, and psychopathology; 3) developmental history; 4) current life situation (e.g. utilization of social support); and 5) motivations and expectations. (LeMont, Moorehead, Parish, Reto & Ritz, 2007)

In Europe, interdisciplinary guidelines for surgery include an assessment of motivation and willingness to adhere to follow-up guidelines, expectations, as well as "behavioral, nutritional, familial and personality factors" (Fried et al., 2017, p. 45). Ultimately, the focus of the European guidelines for pre-operative assessment is to help predict how the patient will adhere to post-surgical recommendations. In 2016, members of the ASMBS updated the 2004 evaluation recommendations to provide more inclusive and detailed guidelines for the evaluation (Sogg, et al., 2016). The authors added domains of Quality of Life and expanded on patient motivation and knowledge to include weight loss expectations, and knowledge of surgical procedures, risks, and benefits.

There is no literature currently available that assesses specific adherence to these recommendations; however, there is information regarding the most commonly used procedures (Ashton, Favretti & Segato, 2008). In a survey of mental health professionals who perform these evaluations, 92.3% indicated that psychiatric issues are "clear contraindications" of surgery, with no specific disorder identified by the majority of respondents. Additionally, 98.5% of respondents reported that their assessments included clinical interviews (e.g. the Structured

Clinical Interview for DSM-5), 68.6% symptoms inventories (e.g. Beck Depression Inventory), 63.4% objective personality/psychopathology tests (e.g. the Minnesota Multiphasic Personality Inventory), 38.1% cognitive function tests (e.g. mental status exams), and 3.6% projective personality tests (e.g. the Rorschach). After reviewing the current literature regarding evaluation practices, Carolina Flores (2014) stated "without a protocol to be followed, there is no consistency as to the central aspects of the evaluation, its duration, which resources to employ, what to evaluate, who to involve in the process, which contraindications are absolute, and other aspects" (p. 62).

Socioeconomic factors are also assessed in the pre-surgical psychological evaluation. Socioeconomic factors play a significant role in a successful surgery, consistent with the biopsychosocial model of obesity's etiology. In a census study conducted by Livingston & Ko (2004), out of more than five million individuals eligible for bariatric surgery, 29% were near or below the poverty line, 54% had a high school education or less, 12% used Medicaid health insurance, and 16% used Medicare. The authors stated that post-operative health management is more challenging to comply with when financial and educational limitations exist. In a smaller study evaluating patient preparation, higher income, private insurance, employment, and being Caucasian were related to resource attainment for surgery (Balduf, Kohn, Galanko, & Farrell, 2009). Rutledge, Adler, and Friedman (2011), while studying differences between bariatric and non-bariatric surgical candidates among a veteran population, hypothesized that research analyzing the effects of social factors on surgical outcomes is biased, because patients with surgical contraindications are filtered out of the process. Relating this theory back to the findings of Livingston & Ko (2004), a large number of individuals who are surgically eligible, based on weight and comorbid factors, may never receive surgical treatment because they reported

clinically significant mental distress, noncompliant behaviors (e.g. overeating or uncontrolled eating, sedentary lifestyle, substance abuse), problems with cognitive functioning, unrealistic expectations, or a lack of social support. If this hypothesis is correct, then outcome studies evaluating these factors lack ecological validity because patients with problematic psychosocial factors were not included for treatment.

Ambwani and colleagues (2013) conducted an evaluation of over 350 candidates for bariatric surgery during their pre-surgical psychosocial evaluation, using measures of social desirability and impression management. They found that between 33% and 39% of patients scored above the cut-off for impression management, and 62% - 67% scored above the cutoff for social desirability. Patients who demonstrated this response style were more likely to underreport clinically relevant symptoms of anxiety and depression during their interview. The authors concluded that high impression management tendencies on the part of the bariatric surgery candidate may result in an invalid evaluation and/or a need for further testing, and raises questions about what we know about psychopathology in this population.

Motivations for Surgery

The psychological evaluation may also assess patients' motivations for surgery. In a survey of patients preparing to undergo surgery, physical health was ranked as the primary motivation for the procedure, followed by psychological and physical functioning (D. J. Munoz et al., 2007; Wee et al., 2006). Current physical functioning in the literature is often assessed using a domain of the Impact of Weight on Quality of Life-lite (IWQoL-lite), which includes 11 items related to specific behaviors (i.e. picking up objects, tying shoes, getting up from chairs, using stairs, dressing, mobility, crossing legs, feeling short of breath, painful stiff joints, swollen ankles/legs, worry about health; Kolotkin, Crosby, Kosloski, & Williams, 2001). In the surveys

conducted by Munoz et al. (2007) and Wee et al. (2006), patients were given the IWQoL-lite, as well as asked open ended questions about motivation for surgery, or patients were asked to rank the term 'physical health, including mobility and functioning' above or below the terms 'health (including improved health and longevity, and reduced need for medications)' and 'psychosocial health (appearance, self-image, outlook on life, social and societal interaction).' Specific physical health expectations were analyzed, and Karmali et al. (2011) found that urinary incontinence and hypertension were the most motivating comorbidities for surgery, and that 100% of patients had an expectation for some relief of a comorbid condition (e.g. diabetes, sleep apnea, hypertension, etc.).

Motivations for surgery may be particularly important to assess in the psychological evaluation, because dissatisfaction with surgical outcomes, and acceptance of unreasonable surgical risk can manifest as a result of unrealistic expectations for surgery (Kral, 2001). In fact, Wee et al. (2006) found that most patients had unrealistic expectations of weight loss, and reported disappointment with the average percentage of weight loss associated with their procedure. In a follow-up study, Wee et al. (2013) found that patients with lower Quality of Life scores were more likely to have unrealistic expectations for weight loss and were more likely to accept higher risk of mortality from surgery.

Psychological Factors

Obesity and its treatment have been shown to significantly affect mental health. Greenberg et al. (2005) stated that "rates of anxiety and depression are three to four times higher among obese individuals than among their leaner peers."

Depression

The relationship between depression and obesity, according to Luppino et al. (2010), is bidirectional: obesity increases risk for depression, and depression increases risk for obesity. In a meta-analysis of 59 studies, Dawes et al. (2016) found that 19% of pre-operative bariatric surgery patients experienced depression, and 17% had binge eating disorder. There is conflicting evidence for the existence of a relationship between pre-operative mental health problems, such as mood disorders or substance abuse, and post-operative weight loss; however, weight loss surgery was consistently associated with a reduction in depression occurrence, and a reduction in depressive symptoms. Post-operative depression has also been seen to correlate with post-operative weight regain and complications after bariatric surgery (Ramalho et al., 2015). Preiss, Clarke, O'Brien, de la Piedad Garcia, Hindle, and Brennan (2018) suggested a possible physiological response to surgery after finding that in a 6-month follow-up study, patients demonstrated the greatest reduction in depressive symptoms in the first month, with no significant relationship between symptoms improvement and weight loss in a small sample of patients. After three years of follow-up, the Longitudinal Assessment of Bariatric Surgery Research Consortium (LABS) recorded a reduction from 30% of pre-surgical patients meeting criteria for a psychiatric disorder, to 18% three years after the procedure, and again, unrelated to weight loss (Kalarchian, et al., 2016).

Cognitive Functioning

Psychological factors most associated with weight loss from bariatric surgery are ones that influence the ability to regulate behavioral change, like diet and exercise (Wimmelmann et al., 2014). In a review of the literature, Wimmelmann et al. (2014) found that factors such as cognitive functioning and personality influence post-operative weight loss. Specifically, impaired

cognitive functioning has a negative impact on patients' ability to enact changes in their behavior. Additionally, difficulty retaining important lifestyle and procedural information, memory difficulties related to recommendations for care and risk, limited literacy and the ability to review educational material, and executive dysfunction impairing higher order skills such as planning can all interfere in optimal surgical outcomes (Edwards-Hampton & Wedin, 2015).

Personality

The term personality refers to the distinct characteristics in a person's thought, behavior, and emotional patterns (APA, 2016). Personality factors linked with obesity vary depending on the theoretical model of personality being evaluated (Larsen et al., 2004). There are multiple theories explaining personality (e.g. trait theory, type theory, behavioral theory, etc.), and they all use different measurements and descriptions, thus, are challenging to compare to one another in literature reviews. In the Big Five Factor model, high Neuroticism is associated with BMI, problematic eating behaviors, weight gain, as well as ineffective coping strategies, and poor health habits (Larsen et al., 2004; Wimmelmann et al., 2014). Using the Alternative factor model of personality, based heavily on evolutionary psychology, Persistence, or eager ambition, explained 40% of the variance of BMI reduction in one year, even when controlling for other demographic variables. Personality indirectly influences patients' ability to adjust to a post-surgical lifestyle, by influencing their behavioral and psychological adjustment to weight loss (Wimmelmann et al., 2014).

Eating Behaviors

The influence of pre-surgical psychological factors on post-surgical weight loss is mediated by post-operative eating behavior (Kvalem et al., 2016; Wimmelmann et al., 2014). This finding is supported by evidence that patients with pre-operative binge eating behaviors have

a harder time changing their eating behaviors post-operatively to a restrictive intake, and thus lose less weight than those without these behaviors (Canetti, Berry, & Elizur, 2009). Additionally, behaviors associated with unspecific mental distress, including uncontrolled eating and grazing, are most related to risk for unsuccessful outcomes (Sheets et al., 2014; Wimmelmann et al., 2014). Unlike personality and cognitive functions, which are stable conditions, unspecific mental distress could involve temporary fluctuations causing specific behavioral responses.

Characteristics of Bariatric Surgery Patients

Individuals who choose to follow through with bariatric surgery display common characteristics. Patients who opt for bariatric surgery demonstrate characteristics such as a stronger belief in their ability to change (Kvalem et al., 2016). They also often have early onset obesity, are usually women, and are younger (Jakobsen, Hofsø, Røislien, Sandbu, & Hjelmesæth, 2010; Kvalem et al., 2016). Bariatric surgery patients also endorse fewer binge eating behaviors and depressive symptoms than morbidly obese patients who opt out of surgery (Kvalem et al., 2016).

Psychological Intervention

Considering that psychological factors affect surgical success, Greenberg (2005) recommended that, beyond a formal evaluation, psychological intervention to reduce psychological distress, pre and post-operatively, should be included as a component of bariatric surgery programs. Patients who successfully received psychological intervention demonstrate significantly greater weight loss than those who haven't (Clark et al., 2003). Clark et al. described "success" as 12 or more months of abstinence from substance abuse; 12 months of abstinence from any purging behavior; a stable, ongoing relationship with a psychiatrist for at least 12 months for a thought disorder, and at least three months to reassess if treatment for a mood

disorder has improved the individual's psychosocial functioning. Herpertz et al. (2004) theorized that if psychological factors affect weight re-gain following surgery, it may be due to the fact that individuals suffering from serious psychopathology have a harder time adhering to the demands of the controlled eating behavior necessary after bariatric surgery. The authors also noted that "distress based on serious psychiatric disturbance is probably an impediment to obesity surgery, whereas distress based on the experience of being morbidly obese is probably a positive predictor of outcome" (p. 1565). Despite the overwhelming evidence that psychological factors have a wide range of impact on success of bariatric surgery and the quality of life of the patient after surgery, most patients only see a mental health professional for a single screening process before surgery. They may be referred elsewhere for services related to psychological distress such as psychological treatment; however, there is no standardized method of what to do with patients who demonstrate factors related to sub-optimal outcomes for surgery, such as psychopathology, and what it would take to get them back on track. Psychologists can provide psychosocial and behavioral recommendations, and critical feedback that may enhance post-surgical outcome.

Body Image

One of the topics that may be considered in a psychological intervention is body image. Body image is defined as the perceptions, thoughts, and feelings associated with the body and bodily experience (Cash & Pruzinsky, 1990). Originally researched in relation to eating disorders, research on body image has begun to shift its focus to the overweight and obese (Sarwer et al., 2015). The construct of body image includes perceptions about size and shape, attitudes, cognitions, and affect about the body (Dorian & Garfinkel, 2002).

Dissatisfaction with body image related to weight is prevalent in Western society, and is considered normative (Sarwer et al., 2015; Biörserud, Olbers, & Olsén, 2011). Dissatisfaction can

also stem from physical appearance, shape, and tone (Dixon, Esslinger, Yen, & Grimes, 2015). People can overestimate, underestimate, or accurately estimate their body weight. Problems can stem specifically from discrepancies between a person's ideal weight and their perceived weight. The greater the discrepancy, the greater the dissatisfaction (Brytek-Matera, 2011). Ideal size can be heavily regulated by societal influences (McLaren, 2007). Atlantis and Ball (2008) evaluated the accuracy of weight perceptions and their effect on psychological distress. They found that a perception of being overweight or underweight was a higher risk factor for distress than actual weight status or weight misperception.

Overweight individuals may suffer not only from the perception that they are not meeting a societal expectation for weight, but also from the associated stereotypes. Stereotypes about obese people include perceptions that they are noncompliant, unsuccessful, lazy, and impulsive (Puhl & Brownell, 2001; Sutin & Terracciano, 2013). These beliefs are classified as "weight bias" in the literature, and they are negatively related to beliefs that obesity is caused by physiological and environmental factors (Puhl, Latnew, O'Brien, Luedicke, Danielsdottir, & Forhan, 2015). Attitudes like these have led to prejudice and discrimination towards obese individuals. The hostile environment that this creates contributes to poor self-awareness and self-stigmatization in obese populations (Klaczynski, Goold, & Mudry, 2004). Poor self-esteem, perceived self-control, and perceived self-efficacy can lead to problematic coping strategies for weight loss (Kinzl, 2016). Specific examples of these poor coping strategies that have been documented in the literature include binge eating and avoidance of physical activity (Sutin & Terracciano, 2013).

The relationship between bariatric surgery and body image satisfaction has been inconsistent in the literature, based on which procedure is performed, and how satisfaction is measured (Teufel et al., 2012; Ortega, Fernandez-Canet, Álvarez-Valdeita, Cassinello, &

Baguena-Puigcerver, 2012). Teufel et al. (2012) described three main reasons for this discrepancy: first, different surgical procedures have had differing effects on changes in body image (Hotter et al., 2003; Sarwer et al., 2010); second, body image can be measured in different ways, revealing different effects; and third, in certain models, post-operative body image is mediated by post-operative depressive symptoms (Masheb, Grilo, Burke-Martindale, & Rothschild, 2006). There is, however, consistent broader research supporting a correlation between weight loss after bariatric surgery and psychological functioning, using scales that measure depression, anxiety, self-esteem, and Health Related Quality of Life (Stephan Herpertz et al., 2015; Karlsson, Taft, Rydén, Sjöström, & Sullivan, 2007).

Quality of Life

"Quality of life" is considered a multidimensional construct, which includes psychological, physical, and social factors that are measured in various ways, and generally is a subjective report determined by the patient (Mazer, Azagury & Morton, 2017). In a review of the literature on this topic, Mazer, Azagury, and Morton (2017) noted that most larger, long-term studies used quality of life as a secondary measure, and often do not report on specific observations. They added that few studies evaluate predictors of poor quality of life after surgery, and specific threats include social stigma, excess skin, depression, anxiety, and alcohol use disorder. Finally, the authors concluded that the literature is most robust in demonstrating changes after surgery in the physical aspects of quality of life, or Health-Related Quality of Life.

Health-Related Quality of Life is broadly defined, but includes specific domains such as fatigue, bodily pain, and physical limitations (Fabricatore, Wadden, Sarwer, & Faith, 2005; Sarwer et al., 2015). Karlsson et al. (2007) noted, in one of the few long-term follow-up studies available in the literature, that Health-Related Quality of Life was inversely related to weight,

given that as weight decreased, Health-Related Quality of Life increased. Between five and ten years following surgery, both weight and Health-Related Quality of Life perceptions stabilized and demonstrated an overall difference from baseline (i.e. increase in Health-Related Quality of Life and decrease in body mass.) Approximately two-thirds of the 655 cases that remained in the ten-year study were able to maintain a 10% weight loss, which also correlated to a stable increase in Health-Related Quality of Life scores. Stabilized scores are comparable to that of the average-weight population (Sarwer et al., 2015). However, Sarwer et al. (2015) found that, despite increases in reported Health-Related Quality of Life following surgery, many patients did not report any changes in their sexual functioning. Given that some aspects of Health-Related Quality of Life improve after bariatric surgery and others do not, Health-Related Quality of Life is a complex issue, in need of further examination.

Objectification

Objectification theory, originally formulated by Fredrickson and Roberts (1997), concludes that individuals have cultural and interpersonal experiences in which their bodies are considered primarily objects to be inspected and evaluated (Tiggemann, 2013). Considering how one's body looks, rather than feels, can lead to continuous self-surveillance, and eventually objectification is internalized. Self-objectification is linked with increased feelings of shame (Muehlenkamp, Swanson, & Brausch, 2005) and body dissatisfaction (Fitzsimmons-Craft et al., 2012). It can deplete mental resources and lessen cognitive performance (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998), and it is associated with disordered eating (Peat & Muehlenkamp, 2011). Trait self-objectification is thought to be developed by media consumption (Grabe & Hyde, 2009), sexual harassment (Hill & Fischer, 2007), specific sport activities (Harrison & Fredrickson, 2003), exercising in a gym (Slater & Tiggemann, 2006), and being in a sorority

(Rolnik, Engeln-Maddox, & Miller, 2010). Women are more susceptible to objectify themselves than men, and Caucasians are more likely to objectify themselves than African Americans (Hebl, 2004).

Noll and Fredrickson (1998) also found that "the emotion of body shame mediates the relationship between self-objectification and disordered eating." Like body dissatisfaction, body shame occurs when an individual's self-evaluation fails to meet the physical cultural ideals of their society. McKinley and Hyde (1996) developed the Objectified Body Consciousness Scale, with distinct dimensions of self-surveillance, body shame, and appearance control. Tiggemann and Lynch (2001) used this scale to evaluate women across their lifespan. The authors found that body dissatisfaction did not change with age; however, body image, including self-objectification and other appearance related attributes, declines with age. These findings also corresponded with a reduction in restrictive dieting and disordered eating behaviors. Tiggemann and Lynch proposed that, over time, women shift away from an observer's perspective as the most important view of their body. In a longitudinal cohort study, McKinley (2006) found self-objectification results consistent with Tiggemann and Lynch (2001); however, they observed that with a normative, age-related increase in BMI, participants also increased dieting and restrictive eating behaviors.

In a survey study, pre-operative bariatric surgery patients reported their perceived body shape and their ideal body shape. One year after surgery, they reported both their current body shape and ideal body shape. There was a significant decrease in the size of their perceived body shape, as well as a significant decrease in their ideal body shape (D. Munoz et al., 2010). Although the discrepancy between perceived shape and ideal shape also decreased after one year, the shift in ideal shape may indicate unrealistic standards. The authors noted that these findings

suggest a potential risk for post-operative discouragement and body dissatisfaction. A small (N=18), qualitative study conducted by Homer et al. (2016) found that feelings of shame and stigmatization also motivated unrealistic post-operative expectations and desire for bariatric surgery.

Although briefly mentioned, McKinley (2006) recommended that for overweight women, emphasizing physiological functioning rather than weight loss would improve psychological well-being. This recommendation is consistent with a more current "Health-at-every-size" (HAES) paradigm (Gagnon-Girouard et al., 2010). This philosophy emphasizes a positive body image at any BMI, and devalues a preoccupation with weight, while promoting improvements in physical health through active embodiment. Researchers who support the HAES philosophy argue that there are "healthy obese adults" (normal blood glucose levels, blood pressure, and lipid profiles), and achieving or maintaining that status is more important than weight loss for psychological health (Webb, 2016). There is debate surrounding "the obesity paradox," which is based on findings like those of Flegal, Kit, Orpana, and Graubard (2013) who, in a review of studies that included more than 2 million individuals, found that a BMI of 35 (obesity) or higher was associated with higher all-cause mortality but that, paradoxically, a BMI of 25-30 (overweight) was associated with lower all-cause mortality than a BMI of 18.5 – 25 (normal weight). "Healthy obesity" is discussed in more detail in an earlier section titled "Metabolic health." Research applying HAES interventions is limited and currently inconclusive; however, the philosophy has been accepted and promoted heavily in eating disorder and civil rights organizations (Penney & Kirk, 2015).

Appreciating Physical Capabilities

Other work inspired by Fredrickson's objectification theory includes Long and Eash's (2016) emphasis on appreciating the body's physical capabilities and their development of the Appearance and Capabilities Scale (ACS; Long & Eash, 2016). The development of this scale draws from Noll and Fredrickson's (1998) conceptualization of self-objectification, which examines people's focus on their appearance compared to their focus on non-appearance aspects of themselves. Specifically, Noll and Fredrickson measured self-objectification by asking participants to consider five appearance-related self-aspects (e.g., physical attractiveness, firm/sculpted muscles) and five non-appearance-related self-aspects (e.g., strength, physical coordination) and then rank order each self-aspect for how important it was to their feelings about themselves. According to their reasoning, people who rank their appearance as more important than their non-appearance self-aspects would be high in self-objectification.

Building on Noll and Fredrickson's (1998) work, Long and Eash (2016) developed the ACS, which measures the extent to which people focus on their appearance as an important part of their self-concept and the extent to which they appreciate their body's physical capabilities. Specifically, the ACS contains 10 items that assess people's focus on their appearance (e.g., My looks are an important part of the way I see myself) and 10 items that assess people's appreciation for their physical capabilities (e.g., I feel fortunate for the things my body allows me to do). Unlike the rank ordering used by Noll and Fredrickson's measure, the ACS uses a Likert style response scale. According to Long and Eash, individuals who express a greater appreciation for their body's physical capabilities, compared to their appearance, would be considered low in self-objectification. In an internal consistency analysis for the ACS, alpha was .87 for the appearance

subscale, and .90 for the capabilities subscale. The measure also has high test-retest reliability: $r = .78$, $p < .001$ for the appearance subscale, and $r = .82$, $p < .001$ for the capabilities subscale.

Moreover, according to Long and Eash's reasoning, people who show a greater appreciation for their physical capabilities may demonstrate greater psychological and physical wellbeing. Supporting this idea, Eash and Long (2016) found that students who listed five things their body allows them to do, twice a day for six days, demonstrated an increase in appreciation for their capabilities, along with increases in self-esteem and reductions in self-objectification and body shame. This research suggests that interventions that lead people to feel more capable may have important benefits for psychological wellbeing.

Current Study

Although there is substantial evidence supporting bariatric surgery as the most effective treatment for obesity and obesity-related physical comorbidities, there is a lack of comprehensive understanding about the psychological aspects of obesity, the effects of the surgical procedure, and proper treatment of these patients. Thus, the purpose of the current study was to shed light on these factors. The current study evaluated a cross-section of patients, both pre- and post-operatively, in a bariatric surgery program. The pre-operative group completed the ACS, measures of their expectations for how surgery would improve their capabilities and their appearance, and a measure of their desire for surgery. The post-operative group completed the ACS, measures of their perceptions of how surgery has improved their capabilities and their appearance, and a measure of their satisfaction with surgery.

The research proposed here had three aims. The first aim was to evaluate how appreciation for capabilities and focus on appearance is altered following bariatric surgery. It was hypothesized that the surgery, subsequent weight loss, and increases in Health Related Quality of

Life (Stephan Herpertz et al., 2015; Karlsson et al., 2007; van Hout, Fortuin, Pelle, Blokland-Koomen, & van Heck, 2009), would lead to an increase in scores on both subscales of the ACS. A second aim was to observe the effect of pre-operative expectations for how surgery would improve capabilities and appearance on desire for surgery in the pre-operative group. It was hypothesized that expectations for how capabilities would be improved would better predict desire for surgery, as compared to expectations for how appearance would be improved. This hypothesis was based on research regarding patient motivation for surgery, specifically the expressed importance of physical health over appearance (D. J. Munoz et al., 2007; Wee et al., 2006). The third aim was to examine whether post-operative ratings of how capabilities and appearance have improved since surgery can predict satisfaction with surgery. It was hypothesized that perceptions of how capabilities have improved post-operatively would better predict satisfaction with bariatric surgery, compared to perceptions of how appearance has improved.

CHAPTER III

METHOD

Setting and Participants

Participants for the current study were recruited from the Conemaugh Memorial Medical Center's Weight Management Services in Johnstown, Pennsylvania. Johnstown is located in Cambria County, which the U.S. Census Bureau reports had an estimated population of 136,411 as of 2015. Approximately 94.2% of the population identify as White (non-Hispanic), 3.6% African American, 89% have graduated high school, and 12.3% of those under the age of 65 live with a disability. The median income is $42,304, and 15.3% qualify as in poverty (United States Census Bureau, 2016).

Patients who have been referred and approved for bariatric surgery are required to enter a six-month weight management program prior to the procedure. The program includes an initial seminar on the types of surgical procedures, criteria for surgery, guidelines for preparation and recovery, and required lifestyle changes. Surgical procedures that are offered include gastric bypass, adjustable gastric band, and the gastric sleeve. Procedures are performed by either D'Arcy Duke, MD, or Stanley Zagorski, Jr., MD, FACS, both board certified general surgeons who specialize in bariatric surgery. During the six months leading up to surgery, every month, patients are required to meet with a physician. At the meetings, progress related to pre-operative weight loss and behavior change, patient expectations for the procedure, and necessary medical and psychological testing are completed. Nutrition and psychological services are also provided as needed both pre- and post-operatively. A health psychologist performs a pre-surgical evaluation, and she is available to provide patients with pre- and post-operative counseling and interventions related to psychological factors affecting bariatric surgery outcomes, readiness for surgery, behavioral change, body image, and other challenges related to mental distress.

Following the procedure, patients are encouraged to return for follow-up care through the Conemaugh Physician Group Surgery Office at one month, three months, six months, nine months, one year, 18 months, and two years post-operatively. Follow-up care includes assessment and care of surgical complications, diet, and nutrition.

For the current research, a 10-week period in 2018 was selected, and all the patients who entered the program during that period, and all the patients who returned for post-surgery follow-up visits during that period were invited to participate by completing a survey. The final sample included 123 participants, 41 pre-operative patients, and 82 post-operative patients. There were 84 women, 38 men, and one person declined to provide their gender. Patients were between the ages of 19 and 102 with an average age of 48.73 years (SD=14.13), and they identified their race as Caucasian/ White (95.9%), African American/ Black (1.6%), and Hispanic/ Latino (0.8%). See Table 1 for all sample demographics.

Although a reading analysis indicated that a 10th grade education would ensure understanding of the study materials, two respondents indicated having less than a 10th grade education. Removing their data did not alter the results, so they were retained in the analyses.

Table 1
Sample Demographics

Gender	Pre-operative Patients	Post-operative Patients	Total
Male	11 (26.8%)	27 (32.9%)	38 (30.9%)
Female	30 (73.2%)	54 (65.9%)	84 (68.3%)
Age Range	19-67	21-102	
Mean Age	41.8 (SD=13.45)	52.32 (SD=13.18)	
Race			
Caucasian/ White	38 (92.7%)	80 (97.6%)	118 (95.9%)
African American/ Black	1 (2.4%)	1 (1.2%)	2 (1.6%)
Hispanic/ Latino	1 (2.4%)	0	1 (0.8%)
Marital Status			
Single	11 (26.8%)	13 (15.9%)	24 (19.5%)
Married	24 (58.5%)	47 (57.3%)	71 (57.5%)
Divorced	2 (4.9%)	10 (12.2%)	12 (9.8%)
Widowed	0	6 (7.3%)	6 (4.9%)
Separated	1 (2.4%)	1 (1.2%)	2 (1.6%)
In a relationship	3 (7.3%)	2 (2.4%)	5 (4.1%)
Education			
Less than 10^{th} grade	1 (2.4%)	1 (1.2%)	2 (1.6%)
Completed 10^{th} grade	2 (4.9%)	2 (2.4%)	4 (3.3%)
Completed High School/ GED	20 (48.8%)	35 (42.7%)	55 (44.7%)
Some College/ Associate Degree	8 (19.5%)	26 (31.7%)	34 (27.6%)
Bachelor's Degree	4 (9.8%)	9 (11.0%)	13 (10.6%)
Graduate Degree	3 (7.3%)	6 (7.3%)	9 (7.3%)
Current Employment			
Employed Full Time	18 (43.9%)	31 (37.8%)	49 (39.8%)
Employed Part Time	2 (4.9%)	11 (13.4%)	13 (10.6%)
Self Employed	2 (4.9%)	4 (4.9%)	6 (4.9%)
In school full time	1 (2.4%)	1 (1.2%)	2 (1.6%)
Unemployed	6 (14.6%)	9 (11.0%)	15 (12.2%)
Retired/ Disabled	11 (26.8%)	21 (25.6%)	32 (26.0%)
Average BMI	46.73 (SD=7.56)	32.40 (SD=6.94)	37.30 (SD=9.86)
Average Months Since Surgery		50.47 (SD=55.29, Median= 30)	

Materials

Respondents received the following documents on paper to complete and return.

Informed Consent

Participants received and read an informed consent form. The informed consent form detailed the purpose of the study, possible risks and benefits to participants, and contact information for the primary investigators should participants have questions or concerns. Participants were informed that their choice of whether to participate in the study or not would have no bearing on the medical treatment provided to them by the hospital (see Appendices A & B).

Demographics

Participants completed a demographics questionnaire that included questions about their gender, age, race, marital status, education level, employment status, height, and weight. Post-operative patients were also asked for the date of their surgery. (See Table 1; Appendices F & G.)

Questionnaire

Participants who took part in the study prior to surgery completed the pre-operative questionnaire (see Appendix E). Participants who took part in the study after surgery completed the post-operative questionnaire (see Appendix F). Each questionnaire included 54 items total. All items were answered on a scale ranging from 1 (strongly disagree) to 5 (strongly agree) unless otherwise noted.

The pre-operative questionnaire and the post-operative questionnaire both began with the Appearance and Capabilities Scale (Long & Eash, 2016) and measures of participants' current appraisal of their physical capabilities and their physical appearance.

Appearance and capabilities scale. Twenty items comprised the Appearance and Capabilities Scale (ACS; Long & Eash, 2016). This scale contains 10 items assessing the extent to which participants focus on their appearance (e.g., My looks are an important part of the way I see myself) and 10 items assessing the extent to which participants appreciate their physical capabilities (e.g., I appreciate the physical capabilities of my body). The ACS has good test-retest reliability, with r = .78 for the appearance subscale, and r = .82 for the capabilities subscale (Long & Eash, 2016). In an internal consistency analysis for the ACS, alpha was .90 for the capabilities subscale, and .87 for the appearance subscale (Long & Eash, 2016). In the current research, alpha was .64 for the capabilities subscale and .89 for the appearance subscale.

Capabilities appraisal and appearance appraisal. Ten items (five regarding capabilities, and five regarding appearance) were created for this study. It was thought that these items would augment the ACS and strengthen its reliability (although the Cronbach's alpha values reported in the validation studies conducted by Long & Eash, 2016, were very good). However, adding these additional items to the ACS diminished alpha from .64 to -.10 for the Capabilities subscale and from .89 to .59 for the Appearance subscale. Upon reviewing these additional items, it was determined that the additional items addressing Capabilities do not assess patients' appreciation of their body's physical capabilities, as the ACS Capabilities subscale does, but instead assess their appraisal of their body's capabilities (e.g., I am dissatisfied with what my body allows me to do). Similarly, the new appearance items do not assess the extent to which people focus on their physical appearance as a source of their self-views, as the ACS Appearance subscale does, but instead assess their appraisal of their body's appearance (e.g., My body is unattractive).

In light of the unique nature of the constructs assessed by the additional items, they were analyzed separately from the ACS and the constructs were named Capabilities Appraisal and Appearance Appraisal. An internal consistency analysis indicated that alpha for the five items assessing Capabilities Appraisal was only 0.49. The analysis indicated that removing two items would increase alpha to .71, so a composite score was created on the basis of the three remaining items. Alpha for the items assessing Appearance Appraisal was 0.88, so all five items were included in the composite score.

Table 2
Descriptive Statistics

	Pre-Op		Post-Op		Combined	
Scale	Mean (SD)	alpha	Mean (SD)	alpha	Mean (SD)	alpha
ACS- Capabilities	3.26 (.56)	0.60	3.74 (.46)	0.64	3.58 (.55)	0.67
ACS- Appearance	3.58 (.74)	0.87	3.12 (.75)	0.89	3.27 (.77)	0.89
Capabilities Appraisal	1.63 (.56)	0.47	2.01 (.70)	0.76	1.89 (.68)	0.81
Appearance Appraisal	1.90 (.67)	0.77	3.07 (.95)	0.86	2.69 (1.03)	0.87

For respondents taking the pre-operative survey, the ACS (Long & Eash, 2016) and the items assessing Capabilities Appraisal and Appearance Appraisal were followed by measures of Expectations for Improvement in Capabilities and Expectations for Improvement in Appearance post-surgery, and then a measure of Desire for Surgery.

Expectations for improvement in capabilities and appearance post-surgery. Items were developed specifically for this study to assess participants' expectations for how their capabilities and appearance would change as a result of surgery. Specifically, eight items assessed participants' expectations for how their capabilities would improve post-operatively (e.g., Surgery will help my body to be able to do more things). Eight items assessed participants' expectations for how their appearance would improve post-operatively (e.g., My body will look better after surgery). Alpha was .74 for the items assessing Expectations for Improvement in Capabilities, and .83 for Expectations for Improvement in Appearance.

Desire for surgery. Finally, eight questions assessed participants' desire for surgery (e.g., To what degree do you desire to have this surgery?). These questions were assessed on a scale ranging from 1 (not at all) to 5 (very high degree). Alpha was .66. This measure marked the end of the pre-operative survey.

For respondents taking the post-operative survey, the ACS (Long & Eash, 2016) and the measures of Capabilities Appraisal and Appearance Appraisal were followed by measures of perceived Improvement in Capabilities and Improvement in Appearance post-surgery, along with a measure of Satisfaction with Surgery.

Table 3
Descriptive Statistics for Pre-Operative Respondents

Scale	Mean	SD	alpha
Capabilities Expectations	4.12	0.58	0.74
Appearance Expectations	3.09	0.41	0.83
Desire for surgery	3.84	0.64	0.66

Improvement in capabilities and appearance post-surgery. Items were developed specifically for this study to assess participants' perceptions of how their capabilities and appearance have improved as a result of surgery. Specifically, eight items assessed how their capabilities have improved post-operatively (e.g., I am more satisfied with my body's abilities after surgery). Eight items assessed how participants' appearance has improved post-operatively (e.g., My body looks better after surgery). Alpha was .86 for the items assessing Improvement in Capabilities, and .89 for the items assessing Improvement in Appearance.

Satisfaction with surgery. Finally, eight questions assessed participants' satisfaction with surgery (e.g., To what degree has the surgery improved your life?). These questions were answered on a scale ranging from 1 (not at all) to 5 (very high degree). Alpha was .86. This measure marked the end of the post-operative survey.

Table 4
Descriptive Statistics for the Post-Operative Respondents

Scale	Mean	SD	alpha
Improvement in Capabilities	4.27	0.65	0.86
Improvement in Appearance	4.11	0.55	0.89
Satisfaction with Surgery	4.35	0.81	0.86

Design

The design of this study was a quasi-experimental, quantitative, cross-sectional analysis studying the relationship between capabilities, appearance, and desire/satisfaction with bariatric surgery. The quasi-independent variable was operative status (i.e. pre-surgery or post-surgery).

Procedure

Participants attending the orientation seminar provided to surgical candidates to initiate their six-month pre-operative program, and post-operative patients returning for post-surgery follow-up care, were administered a statement of informed consent to keep, and a pre-operative questionnaire to complete on-site. Participants were instructed to return their questionnaire in the envelope that was provided to them, and, upon doing so, they were given a debriefing form (see Appendices C & D). Study materials were provided to participants by a hospital staff member at Weight Management Services.

Hypotheses and Statistical Analyses

The first hypothesis stated that scores on the ACS Capabilities and Appearance subscales would be greater for the post-operative group than the pre-operative group, as a result of weight loss and increased physical functioning that result from surgery. To examine this hypothesis, t-tests were performed to compare the mean scores for the two groups on the capabilities subscale and the appearance subscale of the ACS. Capabilities Appraisal and Appearance Appraisal in the pre-operative and post-operative groups were also compared using t-tests.

The second hypothesis focused on participants who took part in the study pre-operatively, and it stated that expectations for how physical capabilities would be improved by surgery would better predict desire for bariatric surgery, compared to expectations for how appearance would be improved by surgery. A regression analysis was performed to evaluate the predictive power of the independent variables Expected Improvement in Capabilities, and Expected Improvement in Appearance, on the dependent variable, Desire for Surgery.

The third hypothesis focused on participants who took part in the study post-operatively, and it stated that perceptions of how capabilities have improved post-operatively would better predict satisfaction with bariatric surgery, compared to perceptions of how appearance has improved post-operatively. A regression analysis was performed to evaluate the predictive power of the independent variables Improvement in Capabilities, and Improvement in Appearance, on the dependent variable, Satisfaction with Surgery.

CHAPTER IV

RESULTS

Hypothesis 1

The first hypothesis stated that scores on subscales of the ACS, both capabilities and appearance, will be greater for the post-operative group than the pre-operative group. Hypothesis 1 was examined by performing two independent samples t-tests. One compared the composite mean scores for the ACS Capabilities subscale in the pre- and post-operative conditions. The other compared the composite mean scores for the ACS Appearance subscale in the pre- and post-operative conditions. As expected, for the ACS Capabilities subscale, the post-operative group scored significantly higher (M = 3.75, SD = 0.47) than the pre-operative group (M = 3.27, SD = 0.57), t (119) = -4.96, $p < .001$, d = 0.96 (95% CI= 0.87, 1.05). Unexpectedly, for the ACS Appearance subscale, the pre-operative group scored significantly higher (M = 3.59, SD = 0.74) than the post-operative group (M = 3.13, SD = 0.76), t (111) = 3.08, p = .003, d = 0.62 (95% CI = 0.48, 0.75). Upon reflection, perhaps this result is not so surprising. The ACS Appearance subscale assesses the extent to which people focus on their appearance and consider it an important source of their self-views. It may be the case that members of the pre-operative group are suffering from weight stigma, which leads them to focus more on their appearance. As weight diminishes post-operatively, this weight stigma may also diminish, leading people to focus less on their appearance. This point will be revisited in the Discussion.

Independent samples t-tests also were conducted for the constructs of Capabilities Appraisal and Appearance Appraisal to determine whether differences would be observed between the pre-operative and post-operative groups. For Capabilities Appraisal, the post-operative group scored significantly higher (M = 2.01, SD = .69) than the pre-operative group (M = 1.63, SD = .56), t (121) = -3.01, p = .003, d = 0.59 (95% CI = 0.48, 0.70). Also, for Appearance

Appraisal, the post-operative group scored significantly higher (M = 3.07, SD = 0.95) than the pre-operative group (M = 1.90, SD = 0.67), t (113) = -6.76, $p < .001$, d = 1.36 (95% CI = 1.20, 1.51). These results indicate that post-operative patients evaluated their capabilities and their appearance more favorably than pre-operative patients did.

Hypothesis 2

The second hypothesis stated that expectations for how physical capabilities will be improved by surgery will better predict desire for bariatric surgery, compared to expectations for how appearance will be improved by surgery. The analyses conducted to test this hypothesis included only the participants who completed the survey pre-operatively. First, separate regression analyses were conducted to examine Expectations for Post-Operative Improvement in Capabilities and Expectations for Post-Operative Improvement in Appearance as predictors of Desire for Surgery. Before conducting these analyses, the predictor variables were centered on their means, and these centered values were used in the analyses. The first analysis showed that, as predicted, Expectations for Post-Operative Improvement in Capabilities was a significant predictor of Desire for Surgery, B = .45 (SE = .16), β = .41, t = 2.83, p = .007. The second analysis showed that Expectations for Post-Operative Improvement in Appearance was also a significant predictor of Desire for Surgery, B = .46 (SE = .17), β = .41, t = 2.64, p = .012.

To compare the predictive power of Expectations for Post-Operative Improvement in Capabilities and Expectations for Post-Operative Improvement in Appearance, a simultaneous regression analysis was conducted. The overall model was statistically significant, F (2, 34) = 4.17, p = .024, R^2 = .20. However, neither the Capabilities predictor, B = .28 (SE = .25), β = .26, t = 1.14, p = .262, nor the appearance predictor, B = .24 (SE = .26), β = .21, t = .93, p = .359, was statistically significant. This suggests a high level of overlap in variance between the two

predictors, and indeed the correlation between them was high ($r = .74$, $p < .001$). It appears that, in the pre-operative sample, people who expected that surgery would improve their capabilities also tended to expect that surgery would improve their appearance, and vice versa. High expectations for improvement – in both capabilities and appearance – were associated with a high desire for surgery.

Hypothesis 3

The third hypothesis stated that perceptions of how capabilities have improved post-operatively will better predict satisfaction with bariatric surgery, compared to perceptions of how appearance has improved post-operatively. To test this hypothesis, the analyses conducted included only the participants who completed the survey post-operatively. First, separate regression analyses were conducted to examine Post-Operative Improvement in Capabilities and Post-Operative Improvement in Appearance as predictors of Satisfaction with Surgery. Before conducting these analyses, the predictor variables were centered on their means, and these centered values were used in the analyses. The first analysis showed that, as predicted, Post-Operative Improvement in Capabilities was a significant predictor of Satisfaction with Surgery, $B = .44$ ($SE = .13$), $\beta = .35$, $t = 3.38$, $p = .001$. The second analysis showed that Post-Operative Improvement in Appearance was a marginally significant predictor of Satisfaction with Surgery, $B = .29$ ($SE = .17$), $\beta = .20$, $t = 1.72$, $p = .089$.

To compare the predictive power of Post-Operative Improvement in Capabilities and Post-Operative Improvement in Appearance, a simultaneous regression analysis was conducted. The overall model was significant, $F(2, 73) = 8.81$, $p < .001$, $R^2 = .19$. As observed in the separate analyses, the Capabilities predictor was statistically significant, $B = .68$ ($SE = .18$), $\beta = .51$, $t = 3.76$, $p < .001$, but the appearance predictor was not statistically significant, $B = -0.18$ ($SE = .20$),

β = -0.12, t = -0.89, p = .376. These results suggest that, in the post-operative sample, perceiving that surgery had improved one's capabilities was associated with high satisfaction with surgery, whereas perceiving that surgery had improved one's appearance was not related to satisfaction with surgery.

Ancillary Analyses

In addition to testing the three hypotheses that motivated this research, the data also allowed for an examination of the relationship between time since surgery (among post-operative patients) and the primary outcome measures. As can be seen in Table 5, none of these relationships were statistically significant except for the relationship between time since surgery and satisfaction with surgery. A negative correlation was observed, so that greater time since surgery was associated with less satisfaction with surgery.

Table 5
Ancillary Correlations

Scale	Months Since Surgery
	r
ACS Appearance	-0.18
ACS Capabilities	0.07
Surgical Capabilities	-0.08
Surgical Appearance	0.09
Capabilities Evaluation	0.04
Appearance Evaluation	0.02
Satisfaction with Surgery	-0.24*

Note. Where marked with an *, the correlation coefficient was statically significant, $p<0.05$.

CHAPTER V

DISCUSSION

Overview of Findings

Although there is substantial evidence supporting bariatric surgery as the most effective treatment for weight loss and obesity-related physical comorbidities, there is a lack of comprehensive understanding about the psychological aspects of bariatric patients, the long-term effects of the surgical procedure, and follow-up treatment of these patients. Thus, the purpose of the current study was to shed light on these factors by 1) comparing perceptions of capabilities and appearance among pre-operative patients and post-operative patients, 2) comparing expectations for improvement in capabilities and appearance as predictors of desire for surgery (among pre-operative patients), and 3) comparing improvement in capabilities and appearance as predictors of satisfaction with surgery (among post-operative patients).

Confirming prediction, postoperative patients expressed significantly greater appreciation of their physical capabilities than their preoperative counterparts did. Following bariatric surgery, patients expressed more gratitude for what their body can do, which may reflect a positive change in physical functioning due to weight loss, or a reduction in obesity-related comorbidities. Supporting the notion that appreciation for capabilities was higher in the postoperative group because these patients were physically able to do more after the surgery, postoperative patients reported a significantly higher appraisal of their physical capabilities than preoperative patients did. In contrast, postoperative patients expressed less focus on their physical appearance as a source of their self-views compared to the preoperative group. This finding may stem from weight stigma experienced by preoperative patients. As patients lose weight post-operatively, this weight stigma may diminish, liberating them from focusing on their appearance as a measure of their

self-worth. Indeed, post-operative patients appraised their appearance more favorably than pre-operative patients did, and BMI was lower in post-operative patients, as well.

As expected, among pre-operative patients, expectations that weight-loss surgery would improve their physical capabilities was a significant predictor of desire for surgery. Unexpectedly, expectations that the surgery would improve their physical appearance was also a significant predictor of desire for surgery. In fact, these predictor variables were highly correlated, indicating that people who expected that surgery would improve their capabilities also tended to expect that surgery would improve their appearance, and vice versa. Although these variables did not independently predict respondents' desire for surgery, together they accounted for approximately 20% of the variance in respondents' desire to undergo weight-loss surgery. As a result, the second hypothesis in this study was only partially supported. Although expectations of how physical capabilities would be improved by weight-loss surgery emerged as an important predictor of desire for surgery, these expectations regarding improvement in physical capabilities did not better predict desire for surgery than expectations for how physical appearance would be improved by surgery. This finding may be explained as an artifact of how these perceptions were assessed, given the significant relationship between the variables. It is possible that improvement in the wording of the items used to assess these constructs could result in measures that exhibit better discriminant validity. However, it is also possible that the high correlation between these measures reflects a tendency for preoperative patients to believe that the surgery will result in general improvement to a variety of areas of life, without focusing those expectations for improvement on one particular area.

For post-operative respondents, reported improvements in physical capabilities post-surgery emerged as a significant predictor of satisfaction with surgery and accounted for

approximately 13% of the variance in satisfaction with the surgery. In contrast, reported improvements in physical appearance post-surgery did not significantly predict satisfaction with surgery. These findings support the third hypothesis, which stated that perceptions of how capabilities have improved postoperatively will better predict satisfaction with bariatric surgery, compared to perceptions of how appearance has improved postoperatively. This is also consistent with the Health-Related Quality of Life literature, particularly the positive relationship that has been observed between Health-Related Quality of Life, which includes domains in physical functioning, physical role functioning, and vitality (Raoof, et al., 2015; Ware, 2000), and surgical satisfaction.

Implications

In a review of qualitative studies examining the post-operative experience of bariatric surgery patients, Coulman, MacKichan, Blazeby, and Owen-Smith (2017) highlighted the complexities of this life-altering procedure, finding evidence of positive, negative, and neutral experiences, which were further complicated by changes over time. The authors identified three global themes related to life after surgery, which included control, normality, and ambivalence. The theme of control included a desire for a greater sense of predictability, especially in relation to food, weight, and health. Normality included a wish for the feeling of social acceptance or having the same experiences as individuals who were not obese. Ambivalence included recognition of changes, or the absence of change, that weren't considered positive or negative, but did require effort to adapt to. The authors also emphasized the need for long-term follow-up care, including psychosocial intervention to address coping skills, more accurate expectations related to life after surgery, and changes to identity. The current study sheds light on the vital role that perceptions regarding capabilities and appearance may play in these psychosocial interventions. If

new research continues to support the value of considering perceptions regarding capabilities and appearance in the context of bariatric surgery, this evolving clinical understanding could assist with providing targeted supportive therapy and psychotherapeutic interventions for patients who are preparing for the procedure or adapting to the changes that they experience afterward.

The findings of the current study have the potential to inform better psychological treatment for post-operative patients. Greater observance of capabilities improvements is related to greater satisfaction with surgery. An assessment of capability improvement could provide clinically relevant information about the patient's focus of attention when evaluating their body. Intervention to increase patients' awareness of improvements in their physical capabilities could also improve their sense of satisfaction. Distorted beliefs related to body image, body dissatisfaction, and self-worth may have been fostered pre-surgically, and may carry over after surgery without intervention. Cognitive, behavioral, and mindfulness-based strategies to highlight new physical capabilities, rather than a new appearance, could foster the greater sense of control and normalcy recommended by Coulman et al. (2017). Recommended cognitive strategies include restructuring problematic thought patterns about patients' bodies and aligning them with health and physical ability-related goals. Behavioral strategies could include activation of patient activities that highlight their body's new abilities following post-operative weight loss, such as playing with their children, or engaging in fulfilling activities that may have been previously difficult or impossible like exploring their local environment with walking or biking. Mindfulness-based strategies redirect attention, allowing patients the opportunity to notice sensations and actions that otherwise may go unnoticed like the reduction in pain or fatigue, increase in flexibility, or improvement in concentration secondary to better sleep.

The results of the current study also have the potential to inform efforts to broaden the definition of a 'successful' bariatric surgery. The ASMBS, a society founded by surgeons, defines bariatric surgery as a success when at least half of the excess weight is lost, and the loss is maintained for at least five years (ASMBS, 2016). The NIH-funded Longitudinal Assessment of Bariatric Surgery (LABS) study expanded that definition to include the remission of comorbidities like diabetes, hyperlipidemia, and hypertension (Courcoulas et al., 2016). Finally, in the clinical research on bariatric surgery success, Sarwer et al. (2015) suggests that Quality of Life should be included in the estimate of surgical success, given that low Quality of Life is often a motivation for surgical intervention. Like Sarwer and his colleagues, the current study illuminates benefits of surgery that are not limited by numbers on a scale or a blood test, but include more favorable appraisal of what a body can do, and how it looks, concepts that may feel more relevant to the everyday life of a bariatric patient.

Findings from the current study are consistent with the Health-Related Quality of Life literature, in which Health-Related Quality of Life has been shown to increase after bariatric surgery. The current study may even assist with understanding some of the current literature. For example, body mass is inversely related to Physical Health and Mental Health scores on the SF-36 (Ware et al., 1993), the most commonly used measure of Health-Related Quality of Life (Sarwer, Lavery, & Spitzer, 2012; Still, Sarwer, & Blankenship, 2014). After bariatric surgery, as weight declines, both Physical Health and Mental Health scores tend to improve, but the relationship with Physical Health is more robust, compared to Mental Health. The construct of Physical Health includes the subscales of physical functioning, vitality, perceptions of general health, and bodily pain. In the empirical evaluation of the patient experience following surgery, the field has taken steps away from the simple evaluation of weight loss and moved towards a

more holistic approach by including HRQOL. But even HRQOL is limited in evaluating how patients feel towards the changes to their bodies. The current study has found significant relationships between how patients evaluate changes to their body (i.e. improvements to capabilities) and their reaction to the procedure (i.e. satisfaction with surgery). This is the first step towards a better understanding of the patient experience and investigating other factors besides physical functioning that influence the quality of life of a patient following surgery. Further exploration of these ideas is necessary to draw conclusions, but certainly more is known about this aspect of the patient experience with the findings of the current study.

Another domain of Quality of Life that is influenced by body weight is body image concerns. Adding to the literature on bariatric surgery and body image that was highlighted in the literature review, this study provides new details about how patients may be perceiving their bodies following surgery. This study observed that post-operative patients appraised their appearance significantly more favorably than pre-operative patients did. Most likely, weight loss following the surgery led patients to evaluate their appearance more favorably, an explanation that is consistent with research showing that reported increases in body image following surgery are directly associated with weight loss (Boan et al., 2004; Kolotkin et al., 1995; Kolotkin, Crosby et al., 2001; Kolotkin, Meter et al., 2001; Sarwer, Wadden, et al., 2010; Sarwer, Spitzer, Wadden, Mitchell, Lancaster, Courcoulas et al., 2014), although it should be noted that there are inconsistencies in this literature (Teufel et al., 2012; Sarwer et al., 2014). Additionally, appearance focus, a measure linked to self-objectification, was lower in the post-operative group. Overall the findings of this study indicate increased body satisfaction in postoperative patients, which is clinically relevant for providers working with a population that demonstrates high rates

of disordered eating and extreme shifts in appearance (Peat & Muehlenkamp, 2011; Sheets et al., 2014; Wimmelmann et al., 2014).

Finally, the ACS, with its focus on physical capabilities, may provide relevant information to health care professionals who evaluate patients suffering from other illnesses beyond just metabolic conditions. Capabilities appreciation has potential to be a relevant construct in the psychosocial assessment of a wide variety of conditions such as amputation, solid organ transplant, and sexual disorder treatment. For example, in the context of amputation, as a part of the 'pre-hab' process that helps patients prepare for surgery, and the rehabilitation process that takes place after surgery, assessing how a patient evaluates and appreciates their appearance with and without a limb, as well as changes in their physical abilities (e.g. substituting chronic pain for life with a prosthetic) in a formalized measure, could provide valuable insight into areas targeted for treatment. Additionally, patients who receive treatment to increase their appreciation for their body's physical capabilities may be more likely to view the medical procedure as a success. A healthy sense of the many things one can do should be a target for clinicians when treating patients with altered physical conditions. Note that this recommendation fits nicely with the Quality of Life literature, which similarly emphasizes physical functioning.

Strengths of the Current Study

There were several strengths of this study. The two main goals of the study were met: to investigate how bariatric surgery patients view their capabilities and appearance, and how those views relate to both desire to have the surgery (among preoperative patients) and satisfaction with the surgery (among postoperative patients). Gaining access to a specific medical population, and gathering an adequate sample size can be difficult, but both of these objectives were met in the current research, in which a large and inclusive group of respondents took part. Within the

sample, respondents included people with a wide variety of ages, body sizes, and time since surgery. Importantly, the focus on capabilities and appearance highlighted the patient experience over the physical changes in weight, which is a repeated criticism in the literature on the medicalized assessment of bariatric patients (Wolf, Falcone, Kortner, & Kuhlmann, 2000; Brethauer, et al., 2015; Major, et al., 2015). Another expansion of the patient experience included the recruitment of both pre-operative and post-operative patients, rather than a simple focus on what happens to patients after treatment. Finally, the conclusions drawn from this study create what may be a turning point in the discussion, research, and clinical understanding of bariatric surgery patients and the benefits they receive from surgery, as the important role of capabilities gains greater recognition.

Limitations and Future Directions

Despite the strengths of the current study, there are several limitations that must be considered, and also some promising avenues for future research. First, this study included a convenience-based sampling method. This sampling method allows for the possibility that the data collected may not be fully representative of the patients treated at the Conemaugh Medical Center. There was no data collected on the characteristics of patients who chose not to participate in the survey, making it impossible to know what characteristics (if any) were associated with the decision to take part and leaving open the possibility of a self-selection bias that could have affected the study's conclusions. Moreover, fewer pre-operative patients were recruited than expected due to staffing changes during the study, which limited the program's intake of new patients. Future investigations could aim to collect at least basic demographic data on patients who decline to participate, to determine which characteristics, if any, relate to participation.

Another limitation comes from the cross-sectional design of the study. This approach restricts the ability to draw valid conclusions about causality between surgery and outcomes. Because the pre-operative and post-operative data was collected from different individuals, only between-groups analyses could be performed, and not within-groups analyses, which examine changes within individuals over time. A future research direction which would better address these concerns would involve taking a repeated measures approach to data collection. Data collected over time, more than once, from the same individuals, before and after surgery would lend itself to statistical analyses that would allow researchers to draw more definitive conclusions about the changes that occur over time in patients as a result of bariatric surgery.

An additional limitation involves the setting of data collection, which occurred in a hospital during patient visits for treatment. To proactively address the concern that patients might feel obligated to participate in the study because of the setting in which they were recruited, multiple steps were taken to ensure respondents of their anonymity, such as including statements in the consent document emphasizing that the treatment team would never learn whether or not they participated or any of their responses, allowing respondents to retain the consent document (rather than asking them to sign and return it), and providing envelopes in which respondents returned their forms (whether they chose to fill them out or not). It was hoped that ensuring respondents of their anonymity would not only strengthen their feelings of autonomy in choosing whether or not to participate in the study, but also allow those who chose to participate to feel confident in providing honest answers. However, it is still possible that completing the survey in the hospital setting could have led respondents to feel more favorably toward the surgery than they do in other settings (e.g., home), or that close proximity to their treatment team could have led respondents to answer questions in a way that would "help" the team. In the future, to render

these possibilities even less likely, data could be collected outside the hospital, using an electronic or mailed survey.

Another limitation stems from the format of the study, which was a short survey that included only quantitative questions. This type of survey methodology is limited to the specific questions the researchers ask and limited further by a forced-choice answer format. Because of the survey format, many aspects of the patient experience were not addressed, including some that may have been more important to the respondents than the specific research questions that were addressed here. Future research directions could include qualitative approaches that emphasize the patient experience, and these have already begun to a limited degree in the literature (Coulman, MacKichan, Blazeby & Owen-Smith, 2017).

More data is needed to provide a generalizable perspective on the population of bariatric surgery patients. Data collected from the National Inpatient Sample from 2009-2012 (Nguyen, Vu, Kim, Bodunova, & Phelan, 2016) found that in more 390,000 bariatrics patients, the median age was approximately 44, 78% were female, and 60-65% were Caucasian. The current sample was drawn from one hospital in a rural setting, and the median age was approximately 48, 68% were female, and 96% identified as Caucasian. Given the discrepancies between the sample recruited for the present research and population-based characteristics, future research would benefit from recruitment of diverse patient populations from multiple locations with heterogeneous features. Additional data on the effects of socioeconomic status and gender from a more diverse patient population could also provide valuable information known to affect the patient experience (Heymsfield & Wadden, 2017; Hall, Guo, Dore & Chow, 2009; Popkin & Hawkes, 2016; Church, et al., 2011; von Loeffelholz, 2014; Apovian, et al., 2015; McAllister, et al., 2009).

Finally, the scope of this study focused on patients undergoing bariatric surgery; however, the constructs and measures used are applicable to other health-related circumstances. As previously discussed in the Implications section, future directions could include similar investigations of the role of perceptions regarding capabilities and appearance in the context of pre-surgical psychological evaluation and post-operative psychological treatment with regard to a variety of health issues such as transplant surgery or amputation. Evaluating the utility of the ACS constructs and their relation to health-related perceptions in patients could provide valuable information for integrated healthcare clinicians. It is hoped that the research presented here will inspire further investigations of the role of capabilities in bariatric surgery and integrated health care more generally.

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Appendix A

Informed Consent

What is this about?

You are invited to take a survey about how people feel about weight-loss surgery. If you participate, you will be asked to answer questions about your body (including weight and height), your feelings about your body, and your feelings about weight-loss surgery. The questions should take about 10 minutes to answer.

Do I have to do this?

You may choose to participate in this study or not. Participation is voluntary. Your decision will not affect your treatment or your relationship with your doctors or the hospital in any way. If you do not want to participate, simply return the forms. If you do choose to participate, you may stop at any time and return the forms. If you stop the survey partway through, and you wish to have your data destroyed, please write that on the form and put it in the envelope. As you are working on the survey, you may also leave blank any question that you prefer not to answer. Your consent to participate in the survey is implied by completing any part of the survey and returning it.

What about personal information?

Your name will not be connected to your answers, and your answers will be sealed in an envelope. Everything you say on the survey is private and will only be seen by the researchers. Envelopes will remain at the hospital, sealed and behind locked doors, until gathered by the research team. Once gathered, the answers will be put together on a computer, stored in a locked office only accessible by the research team, and the paper will be shredded after three years. Your doctors will not know what you write on the survey or whether you choose to take part in the survey. The treatment team has no interest the outcome of the study, and there is no connection between your survey answers and your medical records.

What will be done with this information?

At the end of the study, the research team will put the responses of everyone together and look for general themes. No one's survey will be looked at on its own. The research team may present what they find to the public, but the names and personal information of the people who take part in the survey will be kept private.

Are there any risks?

There are no known risks connected with participating in this survey. However, participants may find the survey interesting, and they may learn more about how they feel about their body and weight-loss surgery.

What if I have questions?

If you have any questions about this survey, you may ask the person who gave you this form, or you may contact the research team:

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This study has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (phone: 724-357-7730).

Appendix B

Pre-Operative Debriefing Form

Thank you for your participation in this study. We are interested in learning how people's perceptions of how their physical capabilities will be improved by bariatric surgery and how their appearance will be improved by bariatric surgery relate to their desire to move forward with the surgery. We think that expected improvement in capabilities will better motivate people to move forward with the surgery than expected improvement in appearance.

Thank you very much for your participation!

If you would like to learn more about factors related to bariatric surgery, please visit these websites:

The American Society for Metabolic and Bariatric Surgery

https://asmbs.org/patients

National Institute of Diabetes and Digestive and Kidney Diseases

https://www.niddk.nih.gov/health-information/health-topics/weight-control/bariatric-surgery/Pages/overview.aspx

Appendix C

Post-Operative Debriefing Form

Thank you for your participation in this study. We are interested in learning how people's perceptions of how their physical capabilities have improved after bariatric surgery and how their appearance has improved after bariatric surgery relate to their satisfaction with the surgery. We think that improvement in capabilities will be more satisfying than improvement in appearance.

Thank you very much for your participation!

If you would like to learn more about factors related to bariatric surgery, please visit these websites:

The American Society for Metabolic and Bariatric Surgery

https://asmbs.org/patients

National Institute of Diabetes and Digestive and Kidney Diseases

https://www.niddk.nih.gov/health-information/health-topics/weight-control/bariatric-surgery/Pages/overview.aspx

Appendix D

Pre-Operative Questionnaire

Capabilities Items

Below is a list of statements about your body. Please read each statement carefully and mark your general level of agreement with the statement, using the scale below. Please only choose one answer for each statement.

1----------2----------3----------4----------5
Strongly Disagree Strongly Agree

1. I appreciate the physical capabilities of my body. (original ACS item)

2. My body prevents me from physically doing what I want to do. (new item; reverse scored)

3. I am proud of the physical capabilities of my body. (original ACS item)

4. I am dissatisfied with what my body allows me to do. (new item; reverse scored)

5. The physical capabilities of my body are an important part of my self-image. (original ACS item)

6. I often feel grateful for the capabilities of my body. (original ACS item)

7. I have lost control over my body's capabilities. (new item; reverse scored)

8. My body's capabilities are a source of pride for me. (original ACS item)

9. I wish my body were capable of doing more things. (new item; reverse scored)

10. I feel fortunate for the things my body allows me to do. (original ACS item)

11. My body's capabilities have little value to me. (original ACS item; reverse scored)

12. My body is capable of doing things as well as most other people. (new item)

13. I think more often about the things my body allows me to do than the way my body looks. (original ACS item)

14. I don't care much about my body's capabilities. (original ACS item; reverse scored)

15. I appreciate that my body allows me to do so many things. (original ACS item)

Expectations for how Surgery will Improve Capabilities

Below is a list of statements about your surgery. Please read each statement carefully and mark your general level of agreement with the statement, using the scale below. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

16. I will be more satisfied with my body's abilities after surgery.

17. After surgery my body will be capable of doing more things.

18. Surgery will not affect my satisfaction with what my body can do. (reverse scored)

19. I will appreciate what my body is capable of more after surgery.

20. Surgery will help my body to be able to do more things.

21. Surgery will not affect my body's capabilities. (reverse scored)

22. Surgery will give me more control over my body's capabilities.

23. My body will be capable of less after surgery. (reverse scored)

Appearance Items
Below is a list of statements about your body. Please read each statement carefully and mark your general level of agreement with the statement. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

1. My body is unattractive. (new item; reverse scored)

2. My looks are an important part of the way I see myself. (original ACS item)

3. I have lost control over my body's appearance. (new item; reverse scored)

4. My level of satisfaction (or dissatisfaction) with myself comes mostly from the way I look.

(original ACS item)

5. My appearance has little value to me. (original ACS item; reverse scored)

6. When I am in public, I often wonder how I appear to others. (original ACS item)

7. I wish my body were more attractive. (new item; reverse scored)

8. I care about other people's opinions of whether or not I am good looking. (original ACS item)

9. The way I feel about myself depends mostly on how I look to others. (original ACS item)

10. How others view my appearance is of little importance to me. (original ACS item; reverse scored)

11. My body's appearance is comparable to most other people. (new item)

12. It is important to me to look good. (original ACS item)

13. I think more about the way my body looks than what it allows me to do. (original ACS item)

14. I am dissatisfied with what my body looks like. (new item; reverse scored)

15. It is important to me that others find me attractive. (original ACS item)

Expectations for how Surgery will Improve appearance

Below is a list of statement about your surgery. Please read each statement carefully and mark your general level of agreement with the statement. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

16. After surgery my body will have an improved appearance.

17. My body will look better after surgery.

18. I will be more satisfied with my body's appearance after surgery.

19. Surgery will not affect my body's appearance. (reverse scored)

20. Surgery will help my body's appearance.

21. Surgery will give me more control over my body's appearance.

22. Surgery will not affect my satisfaction with my appearance. (reverse scored)

23. I will appreciate my body's appearance more after surgery.

Desire for Surgery Scale

Below is a list of questions about your surgery. Please read each question carefully and mark only one answer for each question.

1----------2----------3----------4----------5
not at all very high degree

1. To what degree do you fear having this surgery? (reverse scored)

2. To what degree do you desire to have this surgery?

3. To what degree do you feel this surgery is unnecessary for you? (reverse scored)

4. To what degree do you believe this surgery is going to improve your life?

5. To what degree are you nervous about this surgery? (reverse scored)

6. To what degree are you looking forward to this surgery?

7. To what degree do you believe this surgery is going to create new problems in your life?

(reverse scored)

8. To what degree do you feel this surgery is really necessary for you?

Appendix E

Post-Operative Questionnaire

Capabilities Items

Below is a list of statement about your body. Please read each statement carefully and mark your general level of agreement with the statement. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

1. I appreciate the physical capabilities of my body. (Original ACS item)

2. My body prevents me from physically doing what I want to do. (new item; reverse scored)

3. I am proud of the physical capabilities of my body. (Original ACS item)

4. I am dissatisfied with what my body allows me to do. (new item; reverse scored)

5. The physical capabilities of my body are an important part of my self-image. (Original ACS item)

6. I often feel grateful for the capabilities of my body. (Original ACS item)

7. I have lost control over my body's capabilities. (new item; reverse scored)

8. My body's capabilities are a source of pride for me. (Original ACS item)

9. I wish my body were capable of doing more things. (new item; reverse scored)

10. I feel fortunate for the things my body allows me to do. (Original ACS item)

11. My body's capabilities have little value to me. (Original ACS item; reverse scored)

12. My body is capable of doing things as well as most other people. (new item)

13. I think more often about the things my body allows me to do than the way my body looks. (Original ACS item)

14. I don't care much about my body's capabilities. (Original ACS item; reverse scored)

15. I appreciate that my body allows me to do so many things. (Original ACS item)

How Surgery has Improved Capabilities

Below is a list of statement about your surgery. Please read each statement carefully and mark your general level of agreement with the statement. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

16. After surgery, my body is capable of doing more things.

17. I am more satisfied with my body's abilities after surgery.

18. Surgery has helped my body to be able to do more things.

19. Surgery has given me more control over my body's capabilities.

20. Surgery has not affected my body's capabilities. (reverse scored)

21. My body is be capable of less after surgery. (reverse scored)

22. Surgery did not affect my satisfaction with what my body can do. (reverse scored)

23. I appreciate what my body is capable of more after surgery.

Appearance Items

Below is a list of statement about your body. Please read each statement carefully and mark your general level of agreement with the statement. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

1. My body is unattractive. (new item; reverse scored)

2. My looks are an important part of the way I see myself. (Original ACS item)

3. I have lost control over my body's appearance. (new item; reverse scored)

4. My level of satisfaction (or dissatisfaction) with myself comes mostly from the way I look.

(Original ACS item)

5. My appearance has little value to me. (Original ACS item; reverse scored)

6. When I am in public, I often wonder how I appear to others. (Original ACS item)

7. I wish my body were more attractive. (new item; reverse scored)

8. I care about other people's opinions of whether or not I am good looking. (Original ACS item)

9. The way I feel about myself depends mostly on how I look to others. (Original ACS item)

10. How others view my appearance is of little importance to me. (Original ACS item; reverse scored)

11. My body's appearance is comparable to most other people. (new item)

12. It is important to me to look good. (Original ACS item)

13. I think more about the way my body looks than what it allows me to do. (Original ACS item)

14. I am dissatisfied with what my body looks like. (new item; reverse scored)

15. It is important to me that others find me attractive. (Original ACS item)

How Surgery has Improved appearance

Below is a list of statement about your surgery. Please read each statement carefully and mark your general level of agreement with the statement. Please only choose one answer for each statement.

1----------2----------3----------4----------5
strongly disagree strongly agree

16. After surgery my body has an improved appearance.

17. My body looks better after surgery. (reverse scored)

18. I am more satisfied with my body's appearance after surgery.

19. Surgery has not affected my body's appearance. (reverse scored)

20. Surgery has helped my body's appearance.

21. Surgery has given me more control over my body's appearance.

22. Surgery has not affected my satisfaction with my appearance. (reverse scored)

23. I appreciate my body's appearance more after surgery.

Satisfaction with Surgery Scale

Below is a list of questions about your surgery. Please read each question carefully and mark only one answer for each question.

1----------2----------3----------4----------5
strongly disagree strongly agree

1. To what degree are you dissatisfied with your decision to have the surgery? (reverse scored)

2. To what degree are you satisfied with the surgery?

3. To what degree do you feel this surgery is unnecessary? (reverse scored)

4. To what degree has the surgery improved your life?

5. To what degree are you dissatisfied with the surgery? (reverse scored)

6. To what degree are you satisfied with your decision to have the surgery?

7. To what degree has the surgery created new problems in your life? (reverse scored)

8. To what degree do you feel the surgery was necessary?

Appendix F

Pre-Operative Demographic Questionnaire

Please complete the following questions. Fill in the blanks or mark the appropriate information. If there is a question that you do not feel comfortable providing an answer for, you may skip it and move on to the next question.

1. Gender
   Male ○ Female ○ Other ○
2. Date of Birth: _____

3. Race
   Caucasian/ White ○ African American/ Black ○ Asian/ Pacific Islander ○
   Hispanic/ Latino ○ American Indian ○ Other ○

4. Marital Status
   Single ○ Married ○ Divorced ○
   Widowed ○ Separated ○ In a relationship ○

5. Education

Less than 10th Grade ○	Completed High School/ GED ○	Bachelor's degree ○	
Completed 10th Grade ○	Some college/ Associate degree ○	Graduate Degree ○	

6. Current Employment
   Employed Full time ○ Self-employed ○ Unemployed ○
   Employed part time ○ In school full time ○ Retired/ Disabled ○

7. Height: _____

8. Weight: _____

Appendix G

Post-Operative Demographic Questionnaire

Please complete the following questions. Fill in the blanks or mark the appropriate information. If there is a question that you do not feel comfortable providing an answer for, you may skip it and move on to the next question.

1. Gender
   Male ○ Female ○ Other ○
2. Date of Birth: _____

3. Race
   Caucasian/ White ○ African American/ Black ○ Asian/ Pacific Islander ○
   Hispanic/ Latino ○ American Indian ○ Other ○

4. Marital Status
   Single ○ Married ○ Divorced ○
   Widowed ○ Separated ○ In a relationship ○

5. Education

Less than 10th Grade ○	Completed High School/ GED ○	Bachelor's degree ○	
Completed 10th Grade ○	Some college/ Associate degree ○	Graduate Degree ○	

6. Current Employment
   Employed Full time ○ Self-employed ○ Unemployed ○
   Employed part time ○ In school full time ○ Retired/ Disabled ○

7. Height: _____

8. Weight: _____

Date of surgery: ___ ___ / ___ ___ (MM / YY)

Appendix H

Letter of Approval from Conemaugh Health System

DEPARTMENTAL APPROVAL

(to be completed by the Chair of Department submitting the research)

PROTOCOL TITLE: Investigating perceptions of capabilities and appearance as predictors of satisfaction with bariatric surgery.

INVESTIGATOR: Jaclyn Fishalow, M.A.

IMPORTANT INFORMATION FOR THE DEPARTMENT AND/OR DIVISIONAL CHAIRMAN:

- You must perform initial scientific review of the protocol.
- You must verify that the principal investigator has the proper education, experience and expertise to conduct the study.
- You must ensure that the principal investigator has sufficient staff and facilities to conduct the research.
- You must ensure that the conduct of this protocol will adhere to all Memorial Medical Center policies and procedures.

I have reviewed the project and believe that the benefits to the human subjects outweigh the potential risks. I consider it a suitable research project for my Department and will monitor its progress for untoward consequences. If I become aware of any information regarding the suitability of this research project, I will immediately notify the Memorial Medical Center Institutional Review Board at 814-534-1639 and the Office of Research Administration at 814-534-3611.

DEPARTMENTAL CHAIRMAN

5/11/14
DATE

D'Arcy Duke MD
Print Name Here

(Note: If the departmental chairman is also an investigator, the signature of a related department chairman must be secured.)

Appendix I

IUP IRB Letter of Approval

Indiana University of Pennsylvania
www.iup.edu
Office of the Associate Dean for Research
School of Graduate Studies and Research
Stright Hall, Room 113
210 South 10th Street
Indiana, PA 15705-1046
P 724-357-7730
F 724-357-2715
www.iup.edu/research

November 21, 2017

Jaclyn Fishalow
819 Oak Street, Apt. B
Indiana, PA 15701

Dear Ms. Boyer:

Now that your research project has been approved by the Institutional Review Board for the Protection of Human Subjects, I have reviewed and approved your Research Topic Approval Form.

Based on the information you have provided on your RTAF, your anticipated graduation date is the earlier of May 2018 or your time-to-degree deadline. This means that you must defend by **no later than April 1, 2018** and all necessary documents are due by this date. A description of the required documents can be accessed at http://www.iup.edu/page.aspx?id=116439. Your dissertation must be submitted to the School of Graduate Studies and Research by April 15, 2018 if you desire to graduate by your anticipated date. You must apply for graduation by May 1, 2018. For deadlines for subsequent graduation dates, please access http://www.iup.edu/page.aspx?id=16683.

The Thesis/Dissertation Manual, additional resources, and information to help you start writing can be found at http://www.iup.edu/graduatestudies/thesis/default.aspx.

Finally, if you change your topic, the scope or methodology of your project, or your committee, a new Research Topic Approval Form must be completed.

I wish you well and hope you find this experience to be rewarding.

Sincerely,

Hilliary E. Creely, J.D., Ph.D.
Associate Dean for Research

HEC/bb

xc: Dr. Deanne Snavely, Dean
Dr. David LaPorte, Graduate Coordinator
Dr. Anson Long, Dissertation Committee Chairperson

Appendix J

Conemaugh IRB Approval

Conemaugh
Memorial Medical Center

INSTITUTIONAL REVIEW BOARD
FWA #00001706

April 13, 2018
Study No.: 17-57
Exempt review

To: Tanya Kindel, PsyD; Jaclyn Fishalow, MA; Richard Kutz, PsyD; Conemaugh Memorial Medical Center

Title: 17-57 Investigating perceptions of capabilities and appearance as predictors of satisfaction with bariatric surgery

Documents Reviewed: IRB Review of Research Application Form; Project Proposal; Informed Consent; Demographic Questionnaire; Pre-Op Capabilities Questionnaire; Preoperative Debriefing Form; Post-Op Capabilities Questionnaire; Postoperative Debriefing Form; Research Review Form

Action: Based on the documents listed above, the IRB has determined the survey to be exempt from the regulations at 45 CFR 46. This decision is based on MMC IRB II. C. 4. b. Research involving the use of …. survey procedures ……as long as the information is recorder in such a manner that the human subjects cannot be identified, directly or through identifiers linked to the subject and any disclosure of the responses outside the research would not place the subjects at risk of criminal or civil liability or be damaging to their financial standing, employability or reputation."

Your study has been assigned the research tracking #17-57. Please reference this number when corresponding with the IRB regarding this study.

Please contact Conemaugh Memorial Medical Center IRB at 814-534-9845 with any questions. Any changes to this study may alter the exempt status and must be submitted to the IRB prior to implementation.

Jessica Masser, DO; Designated Reviewer
Conemaugh Memorial Medical Center IRB

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Johnstown, PA 15905-4398
814-534-9000
www.conemaugh.org

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