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The Effect Of Non-Weight And Shape-Related Appearance Dissatisfaction On Eating Disordered Behaviors

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THE EFFECT OF NON-WEIGHT AND SHAPE-RELATED APPEARANCE
DISSATISFACTION ON EATING DISORDERED BEHAVIORS

by

Terra L. Towne

Bachelor of Science, Rochester Institute of Technology, 2012

A Thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

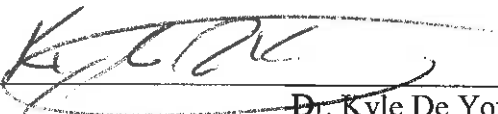
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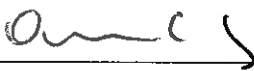
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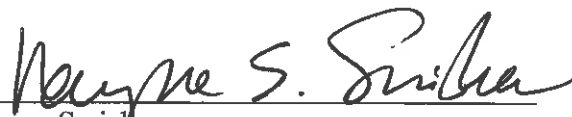


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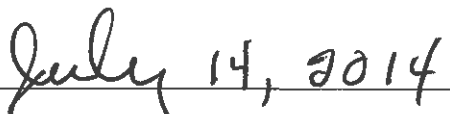


Dr. Alan King

This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies at the University of North Dakota and is hereby approved.



Wayne Swisher
Dean of the School of Graduate Studies



Date

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Title The Effect of Non-Weight and Shape-Related Appearance
 Dissatisfaction on Eating Disordered Behaviors

Department Psychology

Degree Master of Arts

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Terra L. Towne
May 12, 2014

TABLE OF CONTENTS

LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
ABSTRACT.....	vii
CHAPTER	
I. INTRODUCTION.....	1
II. METHOD.....	11
III. RESULTS.....	17
IV. DISCUSSION.....	22
REFERENCES.....	30

LIST OF TABLES

Table	Page
1. Descriptive statistics on independent variables.....	15
2. Descriptive statistics on dependent variables.....	15
3. Descriptive statistics on appearance-related behaviors.....	16
4. Correlations between measures.....	17

LIST OF FIGURES

Figure	Page
1. Non-weight and shape dissatisfaction by malleability interaction.....	18
2. Effect size of NWSAD on compulsive exercise episodes over the past 28 days.....	19

ABSTRACT

Studies have found that greater dissatisfaction with non-weight-related body parts is associated with drive for thinness and body dissatisfaction, suggesting that eating disorder behaviors may be compensatory mechanisms for less malleable aspects of appearance. The aim of the present study was to explore the relationship between non-weight and shape-related appearance dissatisfaction (NWSAD), perceived malleability, and eating disorder and appearance-related behaviors. Participants were students enrolled in undergraduate psychology courses at a mid-size midwestern university. All participants completed the Eating Disorders Examination Questionnaire, Drive for Muscularity Scale, Body Shape Questionnaire, visual analogue scales assessing NWSAD, appearance-related behaviors checklist, and a measure assessing non-weight and shape-related body malleability. Generalized estimating equations were used to determine the relationship between NWSAD, eating disordered and appearance-related behaviors, and perceived malleability. Less NWSAD was associated with more frequent compulsive exercise, while greater perceived malleability was associated with lifetime prevalence rates of indoor tanning bed use and cosmetic dermatologic procedures. Binge eating was associated with a NWSAD by perceived malleability interaction. Results suggest that perceived malleability may increase the likelihood of engaging in appearance-related behaviors and serve as a protective factor for NWSAD. The relationship between low

NWSAD, perceived malleability, and high expectations of weight and shape may influence the occurrence of eating disordered behaviors.

CHAPTER I INTRODUCTION

Body dissatisfaction is defined as the discrepancy between aspects of one's perceived body and aspects of one's ideal body (Maxwell & Cole, 2012). This discrepancy is typically focused on weight and shape and is thought to be relatively constant across the lifespan (Runfola et al., 2013). Although body dissatisfaction is not uncommon, it is associated with the development of eating disorders (Beato-Fernandez, Rodriguez-Cano, Belmonte-Llario, & Martinex-Delgado, 2004; Maxwell & Cole, 2012; Striegel-Moore & Bulik, 2007) and behaviors such as body checking (Latner, 2008; Reas, Whisenhunt, Netemeyer, & Williamson, 2001; Vartanian & Grisham, 2011), obligatory exercise (Brewerton, Stelfox, Hibbs, Hodges, & Cochrane, 1995; Hubbard, James, & Parker, 1998; LePage, Crowther, Harrington, & Engler, 2008), and disordered eating behaviors (Cooley & Toray, 2001; Midlarsky & Nitzburg, 2008; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). A meta-analysis by Jacobi, Hayward, de Zwaan, Kraemer, and Agras (2004) identified body dissatisfaction and weight and shape concerns (an attitudinal, but not affective, dimension of feelings towards one's body; Garfinkel et al., 1992) as the strongest predictors of anorexia and bulimia nervosa in adolescents. Likewise, body dissatisfaction predicted the onset of bulimic symptomatology and increased bulimic pathology in adults. Body dissatisfaction has been identified as the most consistent and robust risk factor for the development and maintenance of eating disorders (Stice, 2002).

While the construct of body dissatisfaction is typically associated with eating disorders, it is not limited to concerns with one's weight or shape. Non-weight and shape body image concerns are highly prevalent in body dysmorphic disorder (BDD). BDD is defined as "preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others." (American Psychiatric Association, 2013). Although it is possible that a diagnosis could be rendered based on preoccupation with body weight or shape, the most frequently reported "defects" in BDD involve perceived asymmetries or flaws of the face, nose, skin, breasts, genitals, and hair (Rosen, 1995). Although the primary body image concerns differ between BDD and anorexia and bulimia nervosa, the disorders are comparable on levels of body dissatisfaction (Hrabosky et al., 2009). The present study aimed to explore the relationship between disordered eating behaviors and non-weight or shape-related appearance dissatisfaction (NWSAD). To the author's knowledge, this is the first study to examine this type of body image dissatisfaction in relation to eating disorder behavior.

Body Dysmorphic Disorder

Clinical significance. Much of what is known about NWSAD stems from the BDD literature. Non-weight and shape body image concerns in BDD are extremely distressing and often become a central concern in the individual's life. Compared to individuals with anorexia and bulimia nervosa, individuals with BDD report greater levels of appearance management investment and overall body image disturbance (Hrabosky et al., 2009). Although "undue influence of body weight and shape on self-evaluation" is a required diagnostic criterion for bulimia nervosa (American Psychiatric Association, 2013), individuals with BDD also report higher levels of this construct

(Hrabosky et al., 2009). This finding suggests that the perception of social or personal worth in BDD is highly dependent on aspects of one's physical appearance.

BDD patients report greater deleterious effects of body image on their quality of life than those with anorexia and bulimia nervosa (Hrabosky et al., 2009). These findings, combined with research indicating that BDD outpatients have poorer mental health-related quality of life compared to patients with depression, diabetes, or a recent myocardial infarction (Phillips, 2000), suggest that BDD is a clinically significant syndrome that necessitates attention. Further, it is not surprising that individuals with BDD engage in a host of coping strategies in attempts to improve their highly distressing body image concerns.

Coping mechanisms and “fixing” behaviors. Hrabosky and colleagues (2009) found that BDD patients reported high levels of “coping by appearance fixing” comparable to individuals with bulimia nervosa. “Fixing behaviors” included covering up perceived imperfections, thinking of ways to change their appearance, reassurance seeking, excessive grooming, and mirror checking. These coping strategies are largely ineffective at mitigating the perception of disliked body parts. Many are extremely time consuming and increase body dissatisfaction and preoccupation. Checking behaviors such as scrutinizing one's appearance in mirrors or repeatedly touching the area of preoccupation are negatively reinforced (Cash 2002; Cash, 2008). Specifically, body checking serves the purpose of managing body image discomfort by reducing anxiety, disgust, or negative affect in general. While checking reduces the desire to know what one looks like, it does not decrease discontent with the appearance of the perceived flaw. Likewise, seeking reassurance from friends, family, and cosmetic surgeons or

dermatologists is counterproductive for this population. Patients typically interpret reassurance attempts by others as disingenuous or even facetious (Phillips, 2005).

Over half of individuals with BDD seek plastic surgery and dermatologic treatment (Phillips, Grant, Siniscalchi, & Albertini, 2001). Given the low point prevalence rate of BDD in the general population (2.4%; American Psychiatric Association, 2013), these patients constitute a large percentage of individuals pursuing these types of services (Auuizerate et al., 2003; Dufresne, Phillips, Vittorio, & Wilkel, 2001; Phillips, Dufresne, Wilkel, & Vittorio, 2000; Sarwer, Wadden, Pertschuk, & Whitaker, 1998). The most common plastic surgeries among BDD patients include rhinoplasty, chin surgery, and breast surgery (Phillips et al., 2001), while common dermatologic procedures include isotretinoin (acne treatment), minoxidil (hair growth treatment), and dermabrasion (surgical scraping used to improve the appearance of scars and wrinkles; Castle, Phillips, & Dufresne Jr., 2004). Dental surgeries and the use of tanning salons are also not uncommon (Phillips et al., 2006; Phillips et al., 2001).

Despite the high prevalence rates of plastic surgery and dermatologic treatment, BDD patients are poor candidates for cosmetic procedures. They often are unsatisfied with the result despite an objectively positive outcome (Phillips et al., 2001; Veale, 2000). A large number of patients experience increased symptoms concerning the same body part or area that was cosmetically altered. However, the research is mixed, and some studies suggest that patients are typically satisfied with the results of certain procedures (Veale, 2000; Veale, De Haro, & Lambrou, 2009).

Regardless, procedure satisfaction does not appear to predict recovery from BDD. The vast majority of patients who are highly satisfied with their procedure still render a

diagnosis of BDD at five-year follow-up (Tignol, Biraben-Gotzamanis, Martin-Guehl, Grabot, & Aouizerate, 2007). BDD patients continue to report greater BDD-related disability compared to non-BDD plastic surgery patients, and about 50% develop a new area of preoccupation. A decrease in overall symptomatology and concern with the treated body part occur following just 7.3 percent of completed treatments (Phillips et al., 2001).

Although over half of cosmetic treatment seeking BDD patients undergo more than one procedure (dermatologic treatment, plastic surgery, or dental treatment), they are often denied these services by medical professionals (Phillips et al., 2001). In the most extreme cases, patients may perform surgeries on themselves, either to correct the body part of preoccupation or to destruct it in hopes of obtaining cosmetic treatment (Phillips et al., 2001). In one study, a patient who was dissatisfied with the “ugliness” of several areas of her body attempted to perform liposuction on her thighs with a knife (Veale, 2000). Another patient was bothered by the redness of his skin and repeatedly exsanguinated himself with a needle and syringe to appear paler. He also gave blood at blood transfusion clinics that would allow him. One patient smashed his nose with a hammer so he could obtain a rhinoplasty (Phillips et al., 2000). In addition to putting themselves at serious risk, patients performing surgery on themselves were not satisfied with the results of their attempts (Veale, 2000).

Eating disorders and NWSAD. As evidenced by the myriad of extreme and time-consuming coping behaviors, BDD patients are highly invested in “fixing” their appearance. As in eating disorders, this likely stems from extreme body dissatisfaction (Kollei, Brunhoeber, Rauh, de Zwaan, & Martin, 2012). While primary body image

concerns in BDD appear to be distinct from those in the eating disorders, past work has identified considerable overlap between BDD and anorexia and bulimia nervosa.

Recent studies have investigated the prevalence of BDD in eating disorders, eating disorders in BDD, and clinically significant commonalities in these populations. Several studies suggest NWSAD in eating disorders is common. Eating disordered patients endorsed greater levels of dissatisfaction with their skin (Gupta & Gupta, 2001) and other non-weight-related body parts than non-clinical controls (Gupta & Johnson, 2000). Interestingly, NWSAD was associated with higher levels of drive for thinness and body dissatisfaction. This suggests that NWSAD may be indicative of greater weight-related body image disturbance.

Similarly, in a study of outpatients with bulimia nervosa, weight was the primary area of concern, but half of participants named secondary areas of concern that were unrelated to weight or shape (Rosen, 1998). This pattern was also observed in subclinical controls being treated for body image disturbances. Both groups listed concerns with scars, skin blemishes, shape of facial features, thinning hair, and small or sagging breasts as particularly bothersome.

Given the high rates of NWSAD among eating disorder patients, it is not surprising that BDD is highly comorbid among this population. Recent studies suggest prevalence rates of comorbid BDD ranging from 12 (Kollei et al., 2013) to 39% (Grant, Kim, & Eckert, 2002) in eating disorder patients. The majority of these patients believed that BDD was either their greatest problem or a major problem in their lives (Grant et al., 2002).

BDD and weight and shape body image dissatisfaction. While numerous studies have examined the prevalence of comorbid BDD in eating disorders, less research has focused on the prevalence of eating disorders in BDD. Findings have suggested lifetime prevalence rates of comorbid eating disorders ranging from 19 (Zimmerman & Mattia, 1998) to 32.5% (Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006) in BDD patients. Despite no differences between BDD participants with and without a comorbid eating disorder on BDD symptom severity, patients with comorbid eating disorders reported greater body image disturbance and dissatisfaction (Ruffolo et al., 2006). The vast majority of the group had developed BDD prior to the onset of their eating disorder. Furthermore, findings by Rabe-Jablonska Jolanta and Sobow Tomasz (2000) suggest that BDD persists for a period of six months or longer prior to the onset of anorexia nervosa in patients who are eventually affected by both disorders. These findings suggest that BDD may serve as a risk factor in the development of eating disorders.

Weight-related body image concerns in BDD are not limited to patients with comorbid eating disorders. Twenty-nine percent of BDD patients with no eating disorder diagnosis reported a history of serious weight concerns (Kittler, Menard, & Phillips, 2007). While weight was not identified as their primary area of concern, patients with weight concerns were significantly more likely than patients without weight concerns to diet, repeatedly change their clothes, and excessively exercise in attempt to improve their appearance.

Compensatory behaviors in eating disorders and BDD. Many of the behaviors that individuals with eating disorders and BDD engage in are compensatory in nature. Strict dieting, excessive exercise, and the use of dietary supplements, laxatives, or

enemas are typically used to compensate for an episode of binge eating or eating in a way that one considers unacceptable. However, any of these behaviors could also be used to compensate for general feelings of fatness or discontent with weight or shape. Behaviors such as extreme grooming, undergoing cosmetic procedures, camouflaging body parts, and seeking ways to alter appearance are frequently endorsed behaviors in BDD used to compensate for perceived flaws and areas of ugliness. Interestingly, frequent use of tanning salons was associated with concerns about weight, frequent dieting, and using laxatives or vomiting for the purpose of controlling weight (O’Riordan et al., 2006). This suggests that tanning may serve as a compensatory behavior for body dissatisfaction, though causal inferences cannot be drawn.

In the eating disorder literature, several of these compensatory behaviors are partially explained by well-supported models. Stice’s dual-pathway model suggests that sociocultural pressures to be thin lead to body dissatisfaction and internalization of the thin ideal (Stice, Shaw, & Nemeroff, 1998). It posits that body dissatisfaction then predicts binge eating through one of two pathways: restrained eating and negative affect. This model also predicts the onset of compensatory behaviors independent of binge eating (e.g., purging or laxative use; Stice & Agras, 1998). The transdiagnostic model, a cognitive-behavioral maintenance model, suggests that perfectionism and low self-esteem, as well as shape and weight overvaluation, contribute to strict dieting and other weight control behaviors (Fairburn, Cooper, & Shafran, 2003). Since this pattern of dieting cannot be maintained, binge eating followed by compensatory behaviors result.

While models of BDD are not as heavily researched, existing models of the disorder contain similar constructs to those proposed in eating disorder models. Veale

(2004) suggests that appearance overvaluation and need for perfectionism contribute to BDD symptomatology. Moreover, a large discrepancy between the perceived and ideal self contributes to depression and hopelessness, which in turn leads to BDD-related compensatory behaviors (Neziroglu, Khemlani-Patel, & Veale, 2008).

While body dissatisfaction predicts these different types of compensatory behaviors, it is often difficult to determine the type of body image concerns that are accounting for them. It has not been established that shape and weight concerns only result in compensatory behaviors related to eating disorders. Likewise, no study has examined compensatory behaviors related to eating disorders as a result of NWSAD.

The goal of the present study was to examine the relationship between disordered eating behaviors and NWSAD. First, consistent with the eating disorder and BDD literature, it was hypothesized that weight and shape-related dissatisfaction would be related to NWSAD. Second, it was hypothesized that NWSAD would be associated with disordered eating behaviors even after accounting for weight and shape-related dissatisfaction, because disordered eating behaviors may serve as a compensatory mechanism used to manage a more controllable aspect of appearance. For instance, in a study measuring perceptions of risk in cardiovascular disease, patients who viewed themselves as more able to change self-attributes exhibited more control and responded less fatalistically regardless of the proposed “level of risk” that the doctor presented (Claassen et al., 2010). Similarly, being an incremental theorist (i.e., someone who believes that attributes of the self are changeable) is associated with successful dieting and appropriate strategies for coping with overweight (Burnette, 2010), while the belief that the cause of obesity is genetic produces less healthy behaviors (Wang & Coups,

2010). Based on these findings, it was hypothesized that perceived malleability of non-weight and shape body image would moderate the relationship between NWSAD and disordered eating behaviors. Specifically, individuals with high NWSAD and who perceive these body areas as nonmalleable would endorse more eating disordered behaviors, while individuals with high NWSAD who perceive these body areas as more malleable would endorse fewer of these behaviors. Lastly, it was hypothesized that NWSAD would be associated with more appearance-related behaviors (e.g., tanning). No specific hypotheses concerning the relationship between perceived malleability and appearance-related behaviors were made.

CHAPTER II METHOD

Participants

Participants consisted of 200 female undergraduates enrolled in psychology courses at a mid-size midwestern university. Fifteen subjects were excluded from analyses upon failing to pass a validity check (i.e., indicating they played quarterback for the Denver Broncos or had eaten lunch with George Washington). All analyses were conducted with 185 participants. Their ages ranged from 18 to 61; the mean age was 19.41 ($SD = 4.23$). The vast majority of participants were Caucasian (95.1%). More than half of participants (54.6%) were college freshmen followed by sophomores (25.4%) and juniors (11.4%). Students received extra credit points or credit towards course requirements for their participation.

Measures

Eating disordered behaviors and weight and shape body image concerns.

The Eating Disorders Examination Questionnaire (EDE-Q; Fairburn, C. G. & Beglin, S., 2008) is a 28-item self-report measure. Two of its four subscales (shape concerns and weight concerns) were used to measure the frequency and severity of eating disorder cognitions over the past four weeks. In the present study, these subscales demonstrated acceptable internal consistency reliability with Cronbach's alphas of .93 and .87. The frequency of self-induced vomiting, compulsive exercise, laxative misuse, and objective binge eating episodes (defined as "eating an unusually large amount of food given the

circumstances, accompanied by a feeling of loss of control”) were also assessed over the past 28 days.

The Drive for Muscularity Scale (DMS) is a 15-item self-report measure (McCreary & Sass, 2000). It is composed of two subscales titled muscle-oriented behavior (MB) and muscle-oriented body image (MBI). The MBI subscale was used to assess the frequency of muscle-related concerns with different areas of the body. In the present study, the MBI subscale demonstrated good internal consistency reliability ($\alpha = .90$).

The Body Shape Questionnaire (BSQ) is a 34-item self-report measure (Cooper, Taylor, Cooper, & Fairburn, 1987). It assesses the frequency of body shape concerns related to fatness, body figure, and avoidance behaviors. In the present study, the BSQ demonstrated good internal consistency reliability with a Cronbach’s alpha of .98.

NWSAD. NWSAD was assessed using horizontal visual analog scales (VAS). Scale endpoints were labeled “not at all dissatisfied” and “highly dissatisfied.” For each body part assessed, participants moved a slider to reflect their level of dissatisfaction. A slider placed on the far left side of the scale represented no dissatisfaction, while a slider placed on the far right side of the scale represented extreme dissatisfaction. When VAS results were analyzed, the endpoint labeled “not at all dissatisfied” corresponded to 0, and the endpoint labeled “highly dissatisfied” corresponded to 100. Sliders placed at intermediate points on the scale were quantified accordingly. The mean of dissatisfaction scores was used to represent dissatisfaction with non-weight and shape-related body parts.

All 34 body parts assessed with VAS were originally used in Brunhoeber's defect rating scale (2009). The measure was developed to assess body image dissatisfaction in BDD and was later used by Kollei and colleagues (2012) to assess non-weight-related body image concerns in patients with eating disorders. For the purpose of the present study, items measuring dissatisfaction with "body weight" and "body shape" were eliminated so only NWSAD was being assessed. While the measure does assess dissatisfaction with the shape of body parts such as the head and genitals, shape-related body image concerns in the present study were limited to those that contribute to overall body size and figure. Therefore, dissatisfaction with the shape of the head or genitals is considered a non-weight or shape-related body image concern. Lastly, the item measuring dissatisfaction with glasses was changed to dissatisfaction with eyes so that only body parts were being assessed. The VAS demonstrated good internal consistency reliability ($\alpha = .96$).

Malleability. The implicit theory of weight measure was developed by Burnette (2010) as an adaption of Dweck's (2000) implicit theory measure of intelligence. Dweck suggests that people hold either an entity theory or an incremental theory. Those who hold an entity theory believe that aspects of themselves are fixed and trait-like, while those who hold an incremental theory believe aspects of themselves are more malleable. Burnette's measure tests these theories in relation to how people perceive their weight. Six items are rated on a 6-point scale ranging from strongly agree (1) to strongly disagree (6).

In the present study, the implicit theory of weight measure was adapted to assess incremental beliefs about non-weight and shape-related body image. Adaptations of the

measure consisted of replacing the term “body weight” with “non-weight or shape-related appearance (e.g., face, teeth, etc.)” The measure demonstrated acceptable internal consistency reliability with a Cronbach’s alpha of .87.

Appearance-Related Behaviors Checklist. Other appearance-related behaviors were assessed with a yes or no checklist. These behaviors included the use of indoor tanning beds and undergoing plastic surgery, cosmetic oral surgery, and cosmetic dermatologic procedures.

Procedure

The study was approved by the university’s institutional review board (IRB). Each participant read a consent form and clicked to indicate their consent prior to completing the study. The consent form contained a description of the study and its confidentiality, an estimated time of completion, the researcher’s contact information, and a list of possible resources should participating in the study cause distress. All participants completed the study online.

Statistical Analysis

A series of one-tailed Pearson’s r correlations were used to test the hypothesis that weight and shape body dissatisfaction and NWSAD are positively correlated. Due to extreme positive skewness in the majority of independent and dependent variables, generalized estimating equations (GEE) were used to test the second and third hypotheses.

NWSAD and perceived non-weight and shape malleability were the two independent variables of interest (Table 1). Dependent variables included the frequency of eating disordered behaviors (i.e., binge eating, compulsive exercise, and self-induced

vomiting) as assessed by the EDE-Q (Table 2). GEE testing binge eating and compulsive exercise were fit using a negative binomial distribution. Due to the low prevalence rates of self-induced vomiting (SIV) in this non-clinical sample, SIV was dichotomized into “present” and “absent.” The GEE was fit using a binary logistic distribution. Since only one participant endorsed using laxatives in the past 28 days, the laxative misuse variable was excluded from the analysis.

Table 1
Descriptive Statistics on Independent Variables

<u>Independent Variables</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>
Non-Weight and Shape Dissatisfaction	0	84.33	24.58	19.34
Perceived Malleability of Non-Weight and Shape-Related Appearance	1	5.67	3.21	.95

*Higher dissatisfaction scores indicate greater dissatisfaction, and higher malleability scores indicate greater perceived malleability.

Table 2
Descriptive Statistics on Dependent Variables

<u>Dependent Variables</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>
Binge Eating	0	28	1.96	4.72
Self-Induced Vomiting	0	14	.14	1.12
Laxative Misuse	0	7	.05	.53
Compulsive Exercise	0	26	3.9	5.93

*All dependent variables are frequencies of behaviors (in number of episodes) over the past 28 days.

Additional analyses were conducted to determine the effect of NWSAD and perceived non-weight and shape-related malleability on appearance-related behaviors

<u>Appearance-Related Behaviors</u>	<u>Percentages</u>
Indoor Tanning Beds	67%
Plastic Surgery	1.1%
Cosmetic Dermatologic Procedures	5.4%
Cosmetic Oral Surgery	3.6%

*Percentages represent the proportion of participants who have engaged in these behaviors.

(Table 3). Specifically, dependent variables included lifetime prevalence rates of tanning bed use and cosmetic dermatologic procedures. Due to the dichotomous nature of the dependent variables, GEE were fit using a binary logistic distribution. Lifetime prevalence rates of plastic surgery and cosmetic oral surgery were excluded from analyses due to the subjective nature of subject responses. For example, it was unclear if the few participants endorsing plastic surgery had undergone the procedure for cosmetic or medical reasons.

The effects of weight (BSQ), shape (BSQ), and muscle-oriented dissatisfaction (DMS MBI subscale) were controlled for in all of the GEEs. The BSQ was selected from various measures of weight and shape-related body image to serve as the independent variable assessing weight and shape concerns. Overall, items on the BSQ are more pertinent to self-evaluation (e.g., “Have you ever felt so bad about your shape that you have cried?”) than shape and weight concerns measured by the EDE-Q.

CHAPTER III RESULTS

Weight and Shape Dissatisfaction

As hypothesized, VAS assessing NWSAD were positively correlated with various measures of shape and weight dissatisfaction and body image concerns (Table 4). This suggests that individuals dissatisfied with their non-weight and shape-related appearance are susceptible to dissatisfaction with their weight and shape-related appearance as well.

Table 4

Correlations Between Measures

	<u>BSQ</u>	<u>EDE-Q Shape Concerns</u>	<u>EDE-Q Weight Concerns</u>	<u>DMS MBI</u>
Non-Weight and Shape Dissatisfaction	.350**	.367**	.321**	.361**

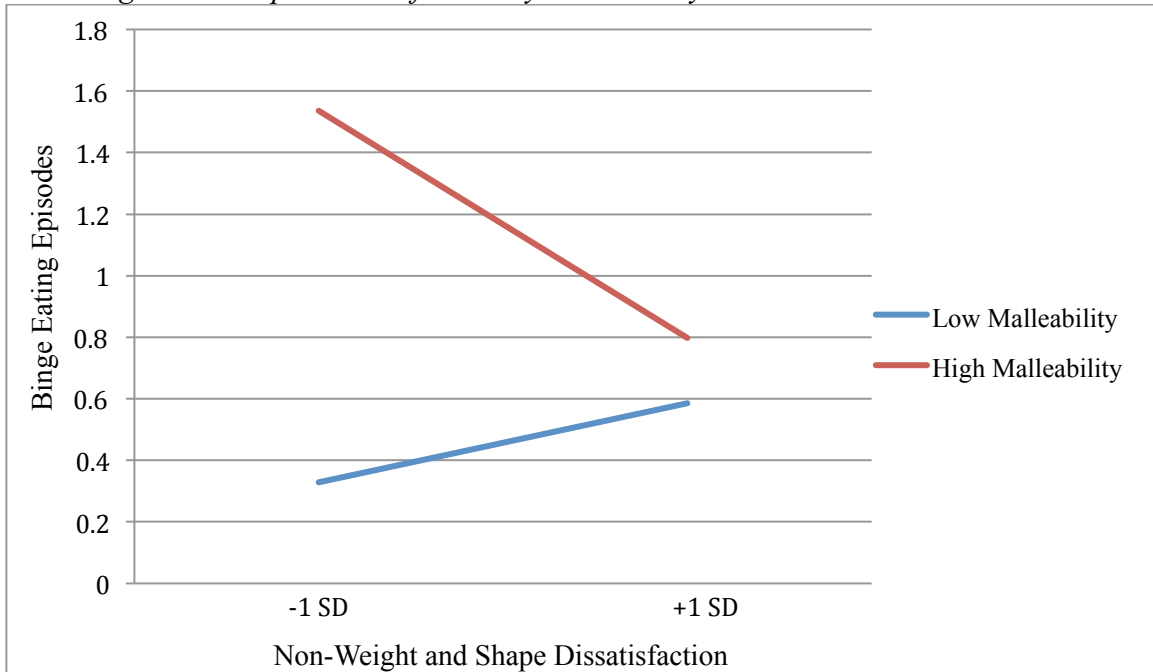
** Correlation is significant at the .01 level (1-tailed).

Binge Eating

There was a significant main effect of perceived non-weight and shape malleability on binge eating frequency (Wald $X^2(1) = 13.45, p < .001$). Contrary to the author's hypothesis, the perception of greater non-weight and shape malleability predicted more frequent binge eating over the past 28 days. There was no main effect of NWSAD on binge eating frequency (Wald $X^2(1) = .017, p = .9$). However, there was a significant NWSAD by perceived malleability interaction effect (Wald $X^2(1) = 5.98, p = .014$; Fig. 1). Among those with less NWSAD, those who perceived non-weight and shape appearance as more malleable binge ate more frequently than those who perceived it as less malleable. Among those with more NWSAD, rates of binge eating were similar

regardless of perceived malleability of concerns. Overall, the highest rates of binge eating occurred in those with less NWSAD and greater perceived malleability. Conversely, the lowest rates of binge eating occurred in those with less NWSAD and lower perceived malleability.

Figure 1
Non-Weight and Shape Dissatisfaction by Malleability Interaction

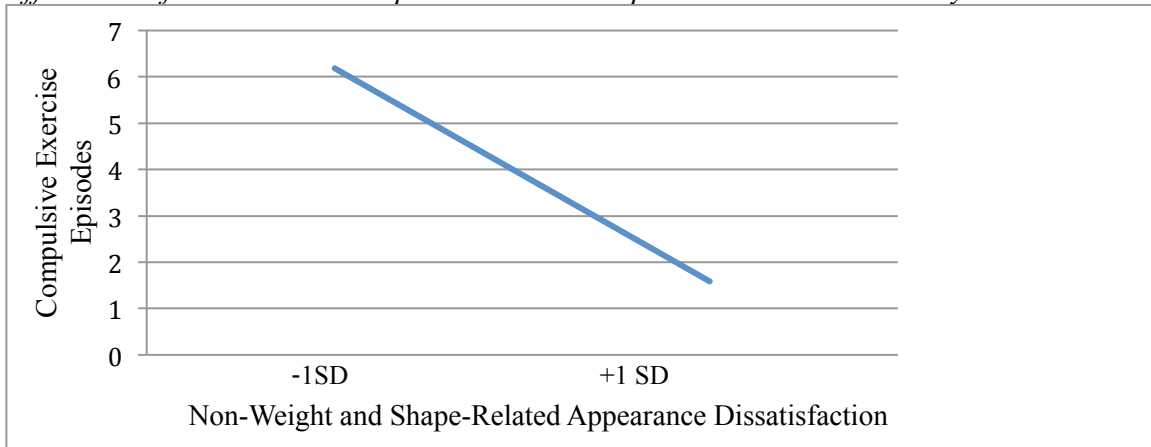


Compulsive Exercise

There was a significant main effect of NWSAD on compulsive exercise frequency (Wald $\chi^2(1) = 24.365, p = .001$) in the opposite direction than hypothesized. Less NWSAD was associated with more frequent compulsive exercise over the past 28 days. The effect size is depicted in Figure 2. There was no significant NWSAD by perceived malleability interaction (Wald $\chi^2(1) = 1.152, p = .21$).

Figure 2

Effect Size of NWSAD on Compulsive Exercise Episodes Over Past 28 Days



Self-Induced Vomiting

Contrary to the hypothesis, there was no significant main effect of NWSAD (Wald $X^2(1) = .139, p = .71$) on the prevalence of compensatory vomiting in the past 28 days. Likewise, there was no significant NWSAD by malleability interaction (Wald $X^2(1) = .34, p = .56$). Due to the low prevalence rates of vomiting in the sample ($n=3$), it is likely there was not enough power to detect any effects.

Tanning Bed Use

Contrary to the hypothesis, there was no main effect of NWSAD on the prevalence of lifetime tanning bed use (Wald $X^2(1) = 1.47, p = .225$). There was a significant main effect of perceived non-weight and shape malleability (Wald $X^2(1) = 3.905, p = .048$). Those who perceived non-weight and shape-related appearance as more malleable were more likely to have used an indoor tanning bed than those who perceived it as less malleable. Specifically, for every one unit increase in perceived malleability, lifetime tanning bed use was 1.48 times more likely to have occurred.

Cosmetic Dermatologic Procedures

Cosmetic dermatologic procedures endorsed by participants included specialized acne treatments, chemical peels, and facial hair removal. Responses listing “facials” as cosmetic dermatologic procedures were recoded as “no” to indicate that participants had not undergone a procedure of interest. Contrary to the hypothesis, there was no main effect of NWSAD on the prevalence of cosmetic dermatologic procedures (Wald $X^2(1) = .146, p = .702$). However, there was a significant main effect of non-weight and shape malleability (Wald $X^2(1) = 7.964, p = .005$). Those with greater perceived non-weight and shape malleability were significantly more likely to have undergone a cosmetic dermatologic procedure than those with lower perceived malleability. Specifically, for every one unit increase in malleability, participants were 3.17 times more likely to have undergone a cosmetic dermatologic procedure.

Additional Analyses

Post hoc analyses controlled for body mass index (BMI) in addition to weight, shape, and muscle-oriented dissatisfaction. BMI was a nonsignificant predictor of all dependent variables with the exception of compulsive exercise. After controlling for BMI, the main effect of NWSAD on compulsive exercise frequency remained statistically significant in the same direction (Wald $X^2(1) = 22.005, p < .001$).

Additional analyses were also conducted to account for the large amount of missing data on VAS assessing NWSAD. Participants with missing data were first compared to participants without missing data. Chi-square tests and independent samples t-tests revealed no group differences on all demographic, independent, and dependent variables ($ps > .05$). However, BMI was significantly lower in participants with missing data ($t(183) = .732, p = .044$).

Analyses were conducted with missing values on the NWSAD VAS recoded as zeros. All main effects and interactions remained statistically significant in the same direction. Analyses conducted with missing data recoded as zeros yielded Akaike's Information Criterion (AIC) values similar to those found in analyses conducted with average reported NWSAD. Analyses were then conducted by excluding participants with missing data on the NWSAD VAS. Predictors remained statistically significant in the same direction with the exception of perceived malleability, which was no longer associated with lifetime tanning bed use (Wald $X^2(1) = 3.643, p = .056$). Analyses excluding participants with missing data yielded lower AIC values than both analyses conducted with average reported NWSAD and missing data recoded as zeros. This suggests that excluding participants with missing data provides a better model fit than analyses using other variations of NWSAD.

CHAPTER IV DISCUSSION

Body Image Concerns

The present study found significant associations between NWSAD and various measures of body image, suggesting individuals with NWSAD are also susceptible to dissatisfaction with shape and weight. These results are consistent with Gupta and Johnson's finding (2000) that eating disorder patients with NWSAD have greater body dissatisfaction. Although measured and analyzed differently, associations in the present study between NWSAD and shape and weight dissatisfaction yielded similar effects sizes ($d = .68$ to $.79$) to those found in the sample of patients with eating disorders ($d = .55$ to $.87$).

In addition to appearance dissatisfaction and concerns with shape and weight, NWSAD was associated with muscle-oriented body image. This suggests that individuals dissatisfied with their non-weight and shape-related appearance are also susceptible to dissatisfaction with their level of muscularity. While drive for muscularity has been studied extensively in males, few studies have examined this phenomenon in women.

Eating Disordered Behaviors

Binge Eating. Contrary to the author's hypothesis, individuals who viewed non-weight and shape body image as malleable and did not endorse high levels of NWSAD binge ate more frequently than any other group. All other groups (low malleability-high dissatisfaction, high malleability-high dissatisfaction, high malleability-low dissatisfaction) binge ate at similarly lower rates. Correlational analyses suggest that individuals who perceive their non-weight and shape-related appearance as malleable

have similar malleability beliefs about their shape and weight. Perhaps these beliefs foster an expectation of perfection toward shape and weight that is inevitably unmet, thus leading to binge eating. The nature of this interaction is difficult to interpret given the paucity of research examining non-weight and shape-related appearance and pathological eating behavior.

Compulsive Exercise. Contrary to the author's hypothesis, less NWSAD was associated with more compulsive exercise. It is possible that individuals who are satisfied with their non-weight and shape-related appearance aspire to attain an equally satisfying body shape and weight. Davis, Dionne, and Shuster (2001) found that women who rated themselves higher on facial attractiveness were overall more focused on their general appearance. Thus, women who are satisfied with their non-weight and shape-related appearance may place a high value on the appearance of their shape and weight. If this speculation is accurate, it is not surprising that those satisfied with their non-weight and shape-related appearance engage in more frequent compulsive exercise.

Due to the correlational nature of the study, it is also possible that individuals perceive their non-weight and shape-related appearance as more attractive because they engage in compulsive exercise. Appleton (2013) found that in addition to perceiving aspects of improved fitness immediately after exercising, participants report greater satisfaction with specific body regions and overall appearance, both of which include non-weight and shape-related body parts. Thus, based on these findings, individuals engaging in compulsive exercise may be reinforced by perceived improvements in their non-weight and shape-related appearance.

Appearance-Related Behaviors

The lifetime prevalence rate of indoor tanning bed use found in the present study (67%) falls within the range of previously reported prevalence rates among female college students (59.5 to 77.5%; Basch, Clarke, Basch, & Neugut, 2012; Mosher & Danoff-Burg, 2010). Lifetime prevalence rates of cosmetic dermatologic procedures (5.4%) were slightly below the national average (8.7%), while lifetime prevalence rates of plastic surgery (1.1%) were consistent with those reported by the American Society of Plastic Surgeons (1%; 2013). It is unknown if the lifetime prevalence rate of cosmetic oral surgeries found in the present study (3.6%) is consistent with female prevalence rates found in the general population; to the author's knowledge, no study has reported these statistics.

Contrary to the author's hypothesis, NWSAD was not significantly associated with lifetime tanning bed use or cosmetic dermatologic procedures. This finding suggests that individuals with high NWSAD do not use tanning beds or undergo dermatologic procedures to compensate for perceived flaws or at least do not do so at a significantly greater rate than those satisfied with their appearance. Perhaps engaging in these behaviors with the intention of altering or improving a perceived appearance defect is specific to NWSAD found in BDD (e.g., tanning to improve the appearance of skin lesions or acne; Phillips et al., 2006).

The belief that non-weight and shape-related appearance is malleable was associated with the use of tanning beds and dermatologic skin procedures. This finding is consistent with the notion that perceived malleability leads to behavioral strategies (Arciszewski, Berjot, & Finez, 2012). While research has found that body and health-related malleability beliefs can lead to positive health changes (Burnette, 2010; Claassen

et al., 2010), it is also possible these beliefs motivate people to engage in less healthy behaviors that are perceived as increasing their attractiveness. Individuals engaging in indoor tanning may overlook potential negative health outcomes in favor of perceived positive social consequences. While indoor tanning is associated with an increased risk for melanoma and squamous cell carcinoma (International Agency for Research on Cancer, 2007; Schulman & Fisher, 2009), a risk that is well understood by the vast majority of college students (72.8%; Lamanna, 2004), beliefs that tanning results in looking healthier and increases physical and interpersonal attractiveness to males are common among female college students (Lazovich, Forster, & Sorensen, 2004; Leary & Jones, 1993). Banerjee, Campo, and Greene (2008) suggest that female perceptions of male tanning beliefs are accurate. In their study, males rated dark-tanned women as thinner and more physically and interpersonally attractive than both medium-tanned and light-tanned women. Therefore, it is understandable that females who hold positive beliefs about tanning and view non-weight and shape-related appearance as malleable are more likely to engage in indoor tanning behaviors.

Conversely, the belief that non-weight and shape-related appearance is malleable may be serving as a protective factor for developing NWSAD. Arciszewski, Berjot, and Finez (2012) found that perceived malleability of body appearance increased the desire to diet but failed to induce threat after exposure to thin-ideal images, presumably due to the belief that attaining a similar body is an achievable goal. If perceived malleability of non-weight or shape-related body image leads to the belief that aspects of perceived unattractiveness can be changed or “fixed”, perhaps these body image concerns are ameliorated before they result in significant dissatisfaction.

The relationship between non-weight and shape-related appearance and perceived malleability may be at least partially explained by internal locus of control, or the belief that reinforcement is contingent on one's behavior as opposed to luck or powerful others (Rotter, 1966). It is likely that perceived malleability of non-weight and shape-related body image is one of many things that people with internally-oriented views believe they are capable of changing. Adame, Johnson, and Cole (2001) found that internally oriented men and women were more satisfied with their overall appearance and specific body areas than those who were externally oriented. Furthermore, they were more likely to consciously live a healthy lifestyle and engage in fitness-enhancing activities, suggesting that holding internally oriented beliefs increases action-oriented behaviors. Based on these findings, internal locus of control may explain the tendency to partake in appearance-related behaviors and the lack of NWSAD found in the present study.

Limitations

The present study was not without limitations. A major limitation involved the primary independent variable of interest: NWSAD. Of the 185 subjects participating in the study, 53 (28.6%) failed to answer at least one item assessing dissatisfaction with a body part. This was possibly due to confusion over how to indicate dissatisfaction (i.e., no click and drag starting points were provided) or what constituted "zero" on the VAS. Although endpoints were labeled "not at all dissatisfied" to "extremely dissatisfied," shaded bars appeared only after participants clicked on the screen. The numerical percentage of dissatisfaction selected was not revealed to the participants. Therefore, it is possible that participants intended to report zero dissatisfaction by clicking so far to the left of the scale that the data were not recorded. However, some participants indicated

zero dissatisfaction with some body parts and still had missing data on others. Consequently, the independent variable “average NWSAD” represents mean dissatisfaction scores of reported data only. It is likely that a significant minority of dissatisfaction scores was over or underestimated for this reason. While post hoc analyses were conducted using different variations of NWSAD, imputing missing data involves significant speculation about a large number of unknown participant responses, and excluding participants with missing data results in a substantial reduction in power. Hypotheses should be tested again with a more reliable measure of NWSAD, which would have to first be developed.

The inability to adequately test important eating disorder behaviors such as SIV and laxative misuse is another major limitation. In a nonclinical sample where both eating disordered behaviors and clinically significant distress over non-weight related body parts are extremely rare, very little statistical power existed to detect a relationship between NWSAD and eating disorder behaviors. It is also possible that normative appearance dissatisfaction in a non-clinical sample is adequately mitigated through the use of compensatory behaviors; thus, engaging in such behaviors may not be associated with NWSAD. Conversely, in clinical populations, individuals with disorders characterized by body image disturbances (i.e., anorexia nervosa, bulimia nervosa, and BDD) tend to engage in maladaptive coping at significantly higher rates than Axis-I controls (Hrabosky, 2009). To determine if eating disorder behaviors serve as a compensatory mechanism in those who are highly dissatisfied with their non-weight and shape-related appearance, the use of a clinical sample would be more appropriate.

Conclusion

The present study found positive correlations between weight and shape dissatisfaction and NWSAD, suggesting that individuals with NWSAD may also be susceptible to dissatisfaction with their weight and shape appearance (Gupta & Gupta, 2001; Gupta & Johnson, 2000; Kitler et al., 2007). Furthermore, the relationship between drive for muscularity and non-weight and shape-related appearance in women was assessed and detected for the first time. Given these relationships, it may be important to assess for NWSAD in clients presenting with weight, shape, or muscle-related dissatisfaction.

Potentially useful relationships between perceived malleability of non-weight and shape-related appearance and appearance-related behaviors were examined. Despite their association with appearance-related behaviors, malleability beliefs may contribute to lower NWSAD. However, interventions focused on enhancing perceived malleability could be difficult to implement without exacerbating appearance orientation and reliance on appearance-enhancing behaviors. Acceptance-based strategies and cognitive restructuring focused on reducing the perceived importance of appearance may be more effective in treating clients with NWSAD.

Future studies should test associations between perceived malleability and appearance-related behaviors experimentally to determine the direction of causality. It would also be interesting to determine if similar relationships exist between perceived malleability and various other appearance-related behaviors. The relationship between perceived malleability and locus of control should be investigated to test the possibility that an internal locus of control causes perceived malleability of non-weight and shape-related appearance.

While NWSAD did not appear to be indicative of eating disorder behaviors, this study still poses several interesting questions for future research. Perhaps experimental research could help elucidate the relationship between NWSAD, perceived malleability, and binge eating. Regardless of its relationship to eating disorder behaviors, NWSAD is relatively unexamined in nonclinical populations. Little is known about its associated coping mechanisms, psychological effects, and protective factors from BDD. Correlates of NWSAD should be further explored to better understand and treat this phenomenon.

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